



SUGAR BEETS: SUSTAINABILITY INDICATORS

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

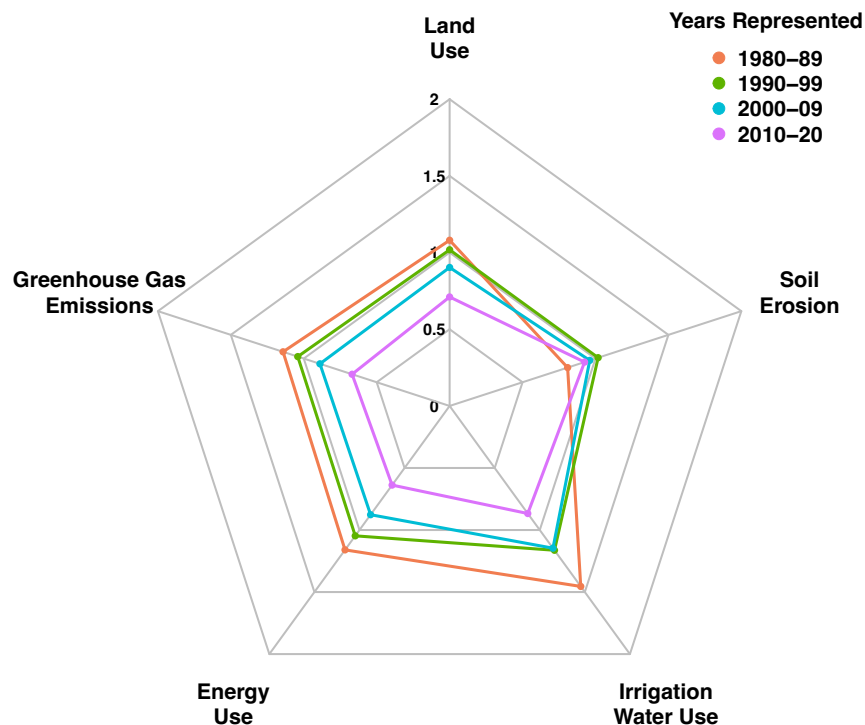
Field to Market’s 2021 National Indicators Report – *Environmental Outcomes from On Farm Agricultural Production in the United States* – analyzes sustainability trends from 1980-2020 at the national scale for 11 commodity crops. Released every five years since 2009, the fourth edition of this peer-reviewed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

Sugar beets are a root crop grown predominantly in cooler climates. Areas of production are concentrated in northern states and the mountain west, with the largest acreage in Minnesota, Michigan, North Dakota, and Idaho.

This figure illustrates the difference in the average indicator value for each decade and demonstrates consistent improvement over time in Land Use, Energy Use and GHG Emissions. The figure also illustrates the dynamics of overall improvement in Irrigation Water Use and little change in Soil Erosion. Smaller values, closer to the center of the figure, represent a smaller environmental impact and more sustainable production of sugar beets.



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

| Indicator | Value | Units |
|--------------------------|-----------|--|
| Land Use | 0.293 | Planted Acres Per Ton of Sugar |
| Irrigation Water Use | 23.6 | Acre-inches Per Ton of Sugar |
| Soil Erosion | 9.56 | Tons Soil Loss Per Acre |
| Energy Use | 2,400,000 | BTU Per Ton of Sugar |
| Greenhouse Gas Emissions | 569 | Pounds of CO ₂ Eq. Per Ton of Sugar |

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 of Sugar | Acre Inches Per Ton of Sugar | BTU Per Ton of Sugar | Pounds of CO ₂ e Per Ton of Sugar | Tons of Soil Loss Per Acre |
| 1980 | 0.3242 | 46.4644 | 2,885,250 | 666.1 | 7.5 |
| 1990 | 0.3083 | 26.9945 | 2,660,990 | 624.8 | 8.8 |
| 2000 | 0.2873 | 26.0884 | 2,353,609 | 558 | 9.8 |
| 2010 | 0.228 | 25.4731 | 1,745,775 | 426.6 | 8.8 |
| 2020 | 0.2001 | 16.8183 | 1,414,350 | 356.4 | 9.1 |

- The Land Use efficiency indicator reflects crop yield increases, with significant improvements throughout the time period of 1980-2020.
- Irrigation Water Use efficiency for sugar beets improved during the 1980s and then fluctuated without a clear trend through 2010 after which time improvement is again observed.
- Energy Use efficiency for sugar beet production has improved throughout the study period, driven by improvements in the energy efficiency of the manufacture of fertilizer and crop chemical inputs. Note that, due to data limitations, application rates were assumed to be uniform throughout the study.
- Trends for GHG Emissions for sugar beets follow the trends for energy use with the major contributor being nitrous oxide emissions from soil and the manufacture of fertilizers and crop protectants.
- Soil Erosion for sugar beet systems increased slightly from 1980 to 2000 and has since held largely steady at approximately 9 tons of soil loss per acre annually.

While substantial progress has been made since 1980 in the sustainability of sugar beet production, the National Indicators Report highlights some areas to focus on to improve data collection as well as 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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