

Life Cycle Analysis Confirms Continuous Improvement in Sustainable U.S. Wheat Production

The results of a new, 40-year “Life Cycle Analysis” of U.S. wheat production confirm that U.S. wheat producers have continually improved the crop’s environmental footprint. **The analysis shows major reductions in greenhouse gas emissions, energy, water and land use, and soil erosion.**

Measuring Continuous Improvement

U.S. wheat farm families are, first, stewards of their land. They are driven every day to produce more and higher-quality wheat in ways that continually nourish and improve the land for the next generation and the planet we share.

The facts confirm this commitment. U.S. wheat yields per acre are up 25% since 1993 while converting 68% of total planted area to no-tillage and other conservation tillage systems.* Winter wheat provides a living soil cover, and wheat crop residue adds organic matter and tilth to the soil. In addition, farmers produce 93% of U.S. wheat without irrigation.*

Now, the Life Cycle Analysis results provide additional estimates of changes in five Key Performance Indicators demonstrating significant improvement in the crop’s environmental footprint.

*Source: USDA NASS.



Greenhouse gas emissions are down 33%

based on a combination of improved nitrogen (N) application efficiency and higher yields per unit of nitrogen.



Energy use is down 57%

from fewer equipment field passes due to more conservation tillage and higher fuel efficiency.



Land use is down 45%

from reduced planted area and improved wheat varieties with higher yield potential.



Water use is down 46%

as farmers reduced their use of irrigation, and yield per unit of water is higher because of improved varieties.



Soil erosion is down 60%

from reduced tillage and other soil conservation practices and incentives.

Methodology

The U.S. wheat industry believes it is important to quantify and share trends in sustainability metrics with the global wheat trade.

So, to establish a baseline of data, U.S. Wheat Associates, the National Association of Wheat Growers, and the National Wheat Foundation chose to conduct this “life cycle analysis” of changes in the environmental impact of U.S. wheat production over a 40-year period from 1978 to 2018.

In 2021, the sponsors selected a respected team of researchers at Texas A&M University AgriLife Research and Colorado State University AgNext Institute to conduct the “U.S. Wheat Production Life Cycle Analysis” (LCA).

The study team compared modern practices to retrospective practices across the diversity of U.S. wheat production. They carefully considered distinct differences in wheat classes, production seasons, protein levels, and end-use functionality that could affect the metrics.

The team created 110 “archetype farms” across representative wheat-producing counties and collected data on both retrospective and modern practices in each county over time. Conclusions were derived using a widely accepted Agricultural Policy Environmental Extender (APEX1) model and “openLCA” life cycle assessment software.

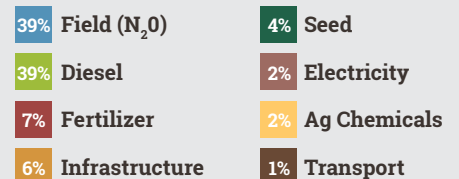
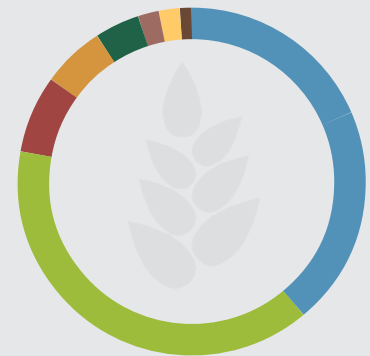
Important Advancements Drive Lower Emissions

The LCA includes specific indicators of change that have helped reduce greenhouse gas emissions from U.S. wheat production.

The study showed that 78% of the overall reduction in emissions resulted from fewer nitrogen fertilizer emissions from fields and reduced emissions associated with diesel fuel.

Also contributing is a consistent decline in emissions from fertilizer due to more prescriptive use and precision application systems.

Contributions to Overall Reductions in GHG From Retrospective to Modern



The sponsors are sharing the results of this first-ever U.S. wheat life cycle analysis with the global grain trade in the spirit of transparency and shared commitment to sustainable food sources. We invite customers and stakeholders to join U.S. wheat industry organizations in continuing to measure and share the positive sustainability trends in U.S. wheat production.