SUSTAINABILITY ANALYSIS

2021 ON-FARM PRACTICES REPORT

About Baker's Acres Inc.

Mike Baker owns and operates Baker's Acres in Trenton, Nebraska. Beyond the farm Mike serves on the Nebraska Grain Sorghum Board.

About Sorghum Checkoff

United Sorghum Checkoff supports growers that are implementing conservation practices, in-field and edge-of-field, on their farms. They are committed to revealing the potential and versatility of sorghum through increased shared value.

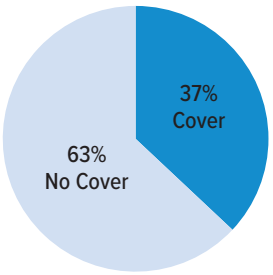
Quantifying the Impact of Actual Farm Practices

The EcoPractices® platform determines environmental benefits through its unique process that can pinpoint specific influences of individual agricultural practices. While agricultural practices have progressed to better care for natural resources, the ability to quantify the influence these practices have on sustainability has not kept pace. Having such data brings more depth to on-farm decision-making while reducing supply chain sustainability risk.

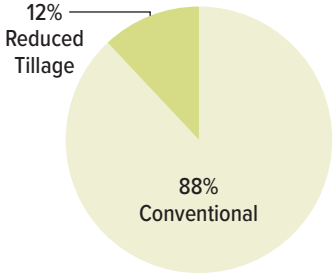
Crop	Yield
Corn Grain	252 bu/ac
Sorghum Grain	83 bu/ac
Winter Wheat	50 bu/ac

1,869 acres from **14** fields

Cover Crops



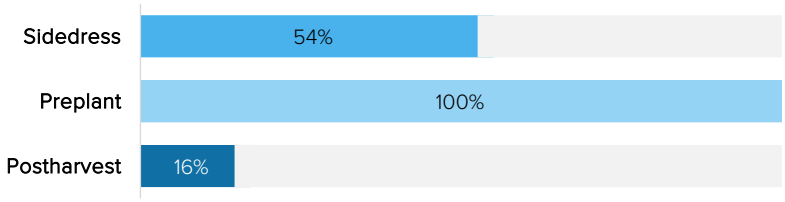
Tillage



According to the 2017 US Ag Census, the national average is **4% cover crop** adoption, **37% no-till** adoption, and **35% reduced till** adoption.

FERTILIZER TIMING

Application timing is an important strategy to minimize fertilizer loss and increase efficiency. Percent acres applied at the following fertilizer timing.



AVERAGE APPLICATION RATE

An average rate of **96** **lbs/ac of nitrogen** and **40** **lbs/ac of phosphorus** was applied.

IRRIGATION

12% **of fields** are **irrigated** at an average rate of **13.9** **ac-in/ac.**

One of the biggest benefits of growing sorghum is its **drought tolerance.** It originated in northeastern Africa and therefore is greatly adapted to arid-semiarid regions. It also requires less inputs, such as nitrogen fertilizer, compared to other grain crops. Sorghum is in the top five cereal grains by production and acreage internationally.**

INTEGRATED PEST MANAGEMENT

2.6 lbs/ac of active ingredient was applied.

63% of acres applied with a **herbicide**

Pesticides, including herbicides, fungicides, and insecticides are part of an Integrated Pest Management program. These are tools of a successful IPM program, and application timing is critical. **Biological, chemical, mechanical,** *and* **cultural** *indicators are also key components in IPM decision making.*

Weather, Soils, and In-Field Management Practices influence the following environmental metrics

IN-FIELD ENVIRONMENTAL OUTCOMES

The data is reflective of weather and soils influence in addition to implemented in-field management practices for the project year.†

	Overall Farm
Net GHG Emissions	**-0.11 T CO_2e/ac**
Soil Carbon Sequestered	**0.15 T C/ac**
Soil Erosion Rate	**1.02 T/ac**

EROSION AVERAGE

*The USDA National Resources Inventory provides estimates on average erosion for different systems across the US.**

Nebraska Cropland	National Average
4.3 T/ac	**4.6 T/ac**

100% of fields have **updated soil tests**

SOIL CONDITIONING INDEX (SCI)

SCI is a tool from NRCS that shows the trajectory of soil health. A positive SCI means a positive trajectory of soil health and vice versa.

The fields in the project are an overall **+ trajectory** for **SCI.**

CROPLAND

100%

IN-FIELD PRACTICE COMPARISON IMPACTS

When compared to conventional practices (i.e. conventional tillage, no cover crop scenario), in-field farm practices generated:‡

125 fewer tons of CO_2e, *which is the same as*

24 average passenger cars off the road for a year

34 tons of soil carbon sequestered

4,953 tons of soil saved instead of being lost to erosion, *which is the same as*

310 dump trucks of soil

<1 ton of nitrogen saved instead of being lost through leaching and runoff.

<1 ton of phosphorus saved instead of being lost through runoff.

SUSTAINABLE Environmental Consultants

Powered by ECOPRACTICES

Data provided by Baker's Acres Inc. for the 2021 growing season and calendar year.

‡‡Sustainable Environmental Consultants, through its EcoPractices platform, estimates an environmental impact value for reducing greenhouse gas emissions, reducing soil erosion, and reducing nutrient loss due to reduced leaching. These estimates adhere to processes that are documented by the NRCS Technical Guides and publications from the EPA. These values are tailored to a specific location and participant's operation. Models used are supported by USDA, NRCS, other government agencies, and major universities. Modeled results include input data from public resources for weather, soils, and historical crop rotation. Greenhouse gas simulations were produced from the Greenhouse Gas Inventory (GGIT) tool developed by Soil Metrics, LLC (2021) https://soilmetrics.eco. The GGIT tool implements the USDA-sanctioned greenhouse gas inventory methods described in Eve et al. (2014) 'Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory". The GGIT tool utilizes greenhouse gas modeling technology developed for the COMET-Farm tool, licensed by Colorado State University to Soil Metrics, LLC.

*USDA, NRCS 2017 National Resource Inventory | **Kansas State University, Department of Agronomy