



# ***Cultivating Success:*** **A Comprehensive Review of The Nature Conservancy's Sustainable Option Wheat Program in Saginaw Bay, Michigan**

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and

Star of the West® Milling Company

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## EXECUTIVE SUMMARY

### Introduction

In 2021, The Nature Conservancy® (TNC) 's Michigan Chapter began piloting a "pay-for-performance" sustainable wheat initiative in Saginaw Bay Watershed, Michigan, to contribute to a more resilient food system in the United States. This program is titled the Sustainable Option Wheat (SOW) Program. Entering the second year of its three-year pilot, TNC commissioned our Dow Sustainability Fellows team in January 2023 to lead an in-depth review of the program's successes and key learnings to date.

### Background

This is TNC's first program of its kind. The organization aims to learn from the pilot program and scale the incentive program across Saginaw Bay and, ultimately, the state of Michigan. Multiple stakeholders are involved, including local farmers, Star of the West Milling Company (SotW), global consumer packaged goods (CPG) companies, and state government agencies such as the Michigan Department of Agriculture and Rural Development (MDARD).

### Results

Our team conducted in-depth interviews with the key program stakeholders throughout the year to provide a comprehensive review of the program. We also analyzed the market for white winter wheat, generated a program feasibility report, and researched comparative case studies to examine the features of successful agricultural incentive programs in the United States. We found that the SOW program has the potential to be scaled. However, TNC must improve and optimize this program to fit the needs of all stakeholders involved. Our team recommends short-, medium-, and long-term steps for TNC to achieve this goal, including those in the conclusion of this report.

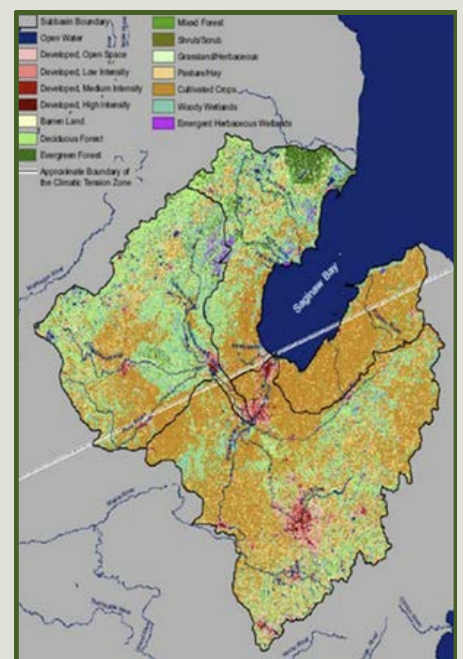


# INTRODUCTION AND BACKGROUND

Agricultural conservation practices such as cover crops, reduced tillage, and nutrient management tackle climate change and protect the water quality of the Great Lakes. Traditionally, local farmers are encouraged to implement agricultural conservation practices through incentive-based programs managed by Federal and State agencies. However, these agencies typically need more resources to conduct robust outreach efforts with stakeholders across the agricultural value chain. The contracting process is also arduous and administratively tricky for interested farmers and crop processors. Furthermore, the demand and financial incentive for crops harvested with agricultural conservation practices has yet to be fully identified in the Great Lakes region. Consequently, only some farmers adopt these programs and sustainable practices.

In 2021, the Michigan chapter of The Nature Conservancy® (TNC) began piloting a sustainable wheat supply chain initiative in the Saginaw Bay Watershed in Saginaw Bay Valley, Michigan (**Figure 1**), to advance sustainable food production in the United States. The Saginaw Bay watershed spans 5.5 million acres and encompasses all or part of 22 Michigan counties. TNC's pilot program is titled the "HSBC Nature-Based Solutions Sustainable Option Wheat (SOW) Program" and is funded by a three-year grant from HSBC Bank (2021 - 2024) titled "Catalyzing a More Resilient U.S. Food System" (TNC, 2023). With a central focus on reducing greenhouse gas (GHG) emissions, the program aims to encourage sustainable agricultural practices within existing supply chains and support a more sustainable and systemic approach to conservation. A farmer can join this program by implementing one or more of TNC's sustainable agricultural practices to grow wheat in Michigan. The grant funder requires farmers to pick a sustainable practice they are currently not utilizing to qualify for the program. **Appendix A** details the sustainable practices included in the current program criteria.

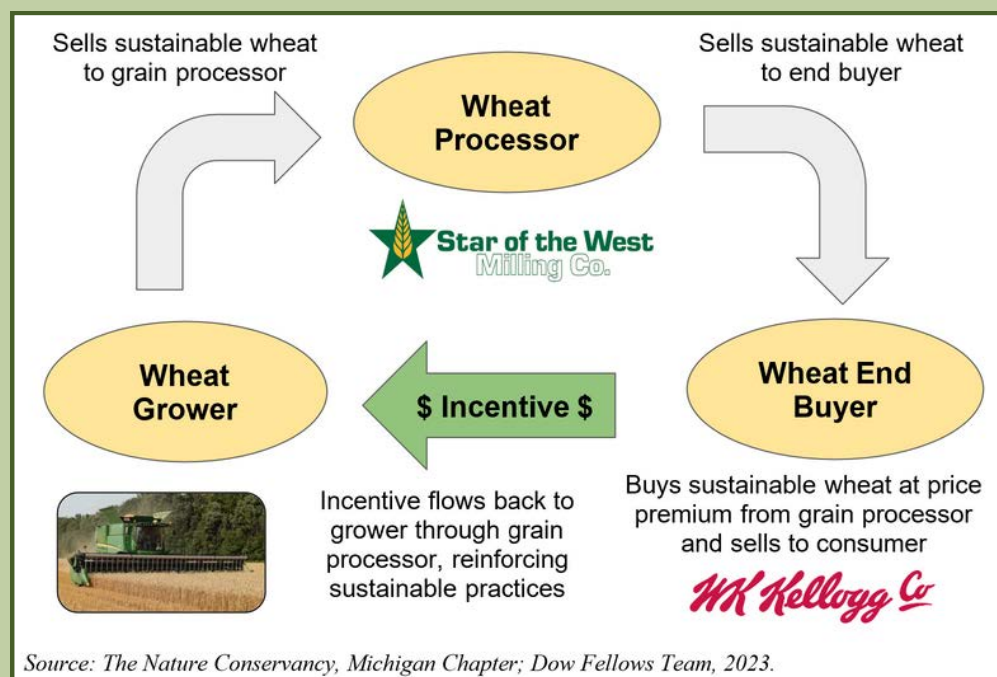
The SOW fits a trend of consumer packaged goods (CPG) companies, grocery retailers, and major non-governmental organizations announcing plans to invest hundreds of millions of dollars into regenerative agriculture (Olson, 2023). Regenerative agriculture is an approach to agriculture that emphasizes holistic agroecological practices to improve environmental and climate outcomes, although there is not a universally accepted definition (Ohletz, 2021). In this report, regenerative agriculture and sustainable agriculture are used interchangeably. While many regenerative agriculture programs usually focus on emissions reductions, a growing emphasis is placed on broader ecosystem services provided by biodiversity and soil health (Carroll & Jenkins, 2008) (Casey, 2023).



**Figure 1:** The Saginaw Bay Watershed, agricultural land (shown in orange) (TNC, 2023).

# INTRODUCTION AND BACKGROUND

The SOW program pilot showcases a funding mechanism for implementing agroecological practices with a lower entry barrier for farmers delivered by their first wheat purchaser, often a regional grain mill or wheat processor. This program has been designed with the direct collaboration of the partner mill to encourage greater recruitment among Michigan farmers. It aims to demonstrate the scalability of sustainability incentive programs embedded directly within the agricultural commodity supply chain. Adherence to TNC’s sustainable practices for growing wheat in an environmentally responsible manner ensures that wheat farmers receive market-based premiums, referred to as “nature-based bonuses,” through this pilot program. Saginaw Valley wheat processor Star of the West Milling Company administers these bonuses and recruits participation from their farmers (wheat suppliers) and customers (wheat buyers). **Figure 2** illustrates the conceptual diagram for the SOW program’s funding mechanism.



**Figure 2:** TNC’s Post-pilot Sustainable Option Wheat (SOW) Funding Mechanism Through the Saginaw Bay Wheat Value Chain.

The SOW program’s proposed conceptual diagram includes the three essential stakeholders throughout the local wheat value chain—CPGs, a local milling company, and farmers. The CPGs purchase directly from the local wheat processor, Star of the West Milling Company, to sell wheat products. The wheat farmers implement TNC’s recommended agricultural practices for sustainable wheat and sell it to Star of the West. The “nature-based bonus” begins with the CPG brands paying a higher purchase price for sustainable wheat to Star of the West, and then Star of the West pays a portion of this higher purchase price to the wheat farmers as a premium for growing sustainable wheat.

# INTRODUCTION AND BACKGROUND

Each stakeholder incurs costs and receives rewards through this process. The farmers receive higher premiums for sustainable wheat crops yet incur investment costs due to operational improvements to implement TNC's sustainable agriculture practices. Star of the West earns a competitive advantage by adding sustainable wheat to its product portfolio. It also takes on the administrative burden of managing the incentives program and ensuring farmers receive their "nature-based bonus." Lastly, CPG brands gain an improved sustainability value proposition for their wheat products, allowing them to attract new consumers. However, they must also pay a higher purchase price for their wheat supply. Ultimately, this program must be financially sustainable for all stakeholders to be fully scaled.

**TNC's main goals for this program include:**

- **Test a sustainability standards program on 6,000 wheat acres.**
- **Reduce sediment and nutrient loss while quantifying these benefits through tracking.**
- **Reduce 5,230 tons of carbon dioxide equivalent.**
- **Demonstrate a replicable business model and export case study report.**

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## PROJECT GOALS

Entering its second pilot year, TNC engaged our Dow Sustainability Fellows team in January 2023 to lead a deep review of the program's successes and key learnings thus far from all program stakeholders. As a team, we aimed to understand and determine the potential scalability of this market-based program. Our project goals were three-fold:

- **Understand the soil, water, and climate conservation benefits achieved through the implementation of the agricultural best management practices recommended in the SOW program.**
- **Capture the program's key learnings thus far through stakeholder engagement for feasibility analysis and future strategy development.**
- **Determine the scalability of this market-based program to other regions and crops.**



# PROJECT METHODS

Our project methodology was constructed around three key pillars: (1) stakeholder engagement, (2) winter wheat market analysis, and (3) strategic recommendations. We began our research by gathering information about the SOW program from our clients at TNC and identifying the key stakeholders we needed to engage with across the program. These stakeholders included four significant groups across the wheat value chain from harvest to end product: (1) farmers participating in the program, (2) Star of the West, (3) CPGs and retailers, and (4) state government agencies. We conducted in-depth interviews throughout the summer months to gather insights from these stakeholders.

In April 2023, we visited the Star of the Westhead headquarters in Frankenmuth, Michigan, to attend annual training on the SOW program. At this event, we met critical stakeholders from Star of the West, learned the essentials of wheat agronomy, and gained the perspective of a grain processor critical to the SOW program. From there, we conducted stakeholder interviews with the CPG brands and retailers virtually over the summer to document potential market signals and program interest. To TNC, this perspective is the most valuable input to our project, as the CPG brands are the end wheat buyers. It was critical to understand whether this program was of value to CPGs and their willingness to fund a sustainable wheat product. To enhance our research, we also interviewed external stakeholders such as representatives from the Michigan agricultural sector and state government such as the Michigan Department of Agriculture and Rural Development (MDARD).

In August 2023, we traveled to Bay City, Michigan, to attend the 2023 Sustainable Wheat Grower Enrichment Event. At this event, we interviewed six wheat farmers who have completed their first year in TNC’s Sustainable Wheat Option program. Each stakeholder interview incorporated pre-interview preparation, question development, interview strategy, a detailed interview script, and a debriefing summary with TNC. We collaborated with TNC throughout the year and held bi-weekly progress meetings to share our learnings and next steps. Building on our interview findings, we also completed secondary research to conduct a white winter wheat market analysis and a comparative analysis of other sustainable crop programs. We also explored alternative incentives and researched our stakeholders. **Figure 3** illustrates our project timeline.



**Figure 3:** “Cultivating Success” Project Timeline

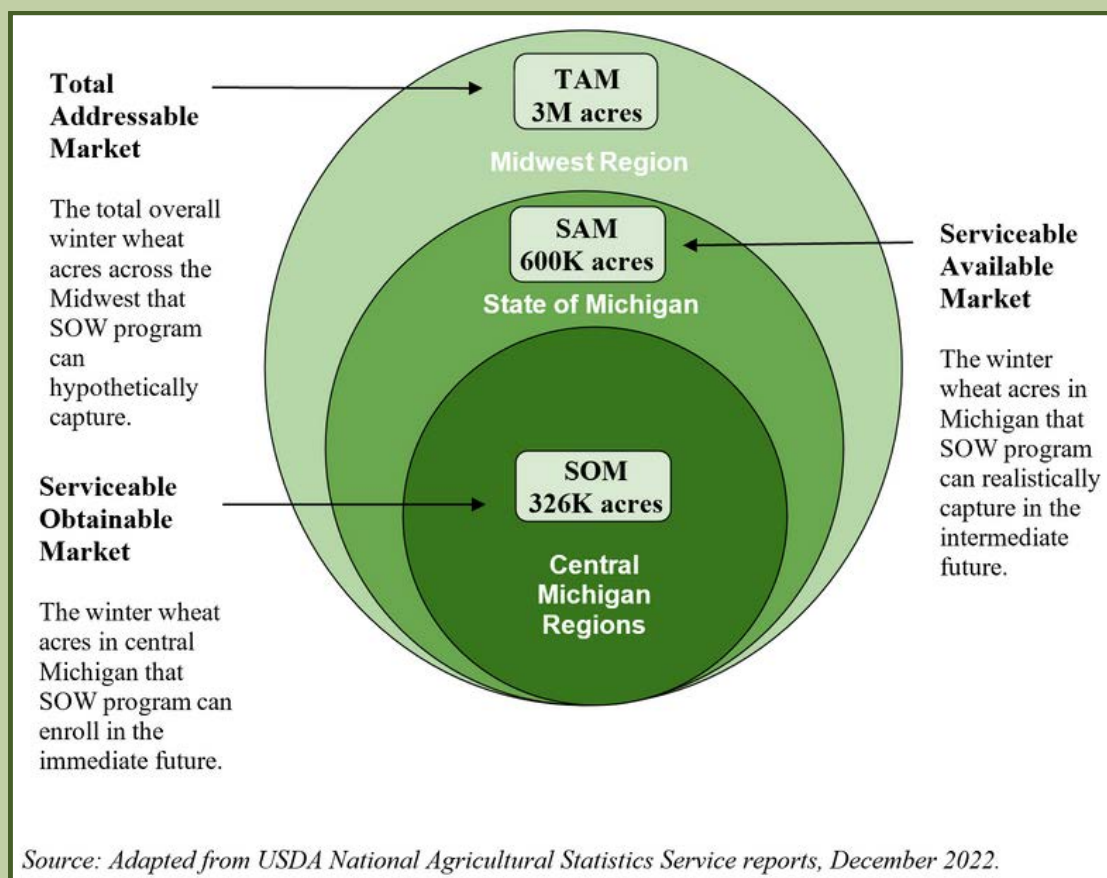
# DELIVERABLES

Our project deliverables include a summary of what we learned from our stakeholder interviews, a detailed market analysis to determine scalability, detailed comparative program case studies, and a set of strategic recommendations across the short, medium, and long term. Learnings from each deliverable are detailed below.

## Winter Wheat Market Analysis

### Market Size

We employed a TAM/SAM/SOM model to estimate the winter wheat market and, thus, the scaling potential of the SOW program. **TAM (Total Addressable Market)** refers to the maximum potential revenue by reaching all consumers. **SAM (Serviceable Available Market)** is the achievable portion of the TAM in the near future. **SOM (Serviceable Obtainable Market)** is the realistic market share a company can capture immediately. However, since the SOW program focuses on environmental goals like soil health and carbon sequestration, we measure market size by acres planted with winter wheat, not revenue. For the purpose of analysis, markets are geographically defined, so the TAM is the Midwest winter wheat market, the SAM is Michigan's, and the SOM is the Saginaw Bay watershed. **Figure 4** illustrates the TAM/SAM/SOM model and market size.



**Figure 4:** Diagram of the TAM (Total Addressable Market), SAM (Serviceable Available Market), and SOM (Serviceable Obtainable Market) Model.

# DELIVERABLES

## **Serviceable Obtainable Market - Central Michigan Regions**

The East Central region of Michigan is the SOW program's most immediate market. The East Central region—home of the Saginaw Bay watershed—has the highest winter wheat acres (185,600 acres) (**Appendix B1 and B2**) by quite a margin. The South Central (102,000 acres) and Central (38,800 acres) regions also have high concentrations of winter wheat farming.

In addition to winter wheat acreage, another measure that defines the SOM of the SOW program is the operational footprint of major grain mills in the state. Grain mills are vital interlocutors in the wheat supply chain, purchasing directly from farmers and wholesaling to CPGs. Due to its substantial market share of the East Central, South Central, and Central regions' wheat acres, the other Star of the West grain elevators, such as Cass City, Gilford, or Rosebush, are potential locus points to recruit additional farmers into the SOW program.

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## **Serviceable Available Market - State of Michigan**

In 2023, Michigan farmers planted 600,000 acres of winter wheat. This volume represents the Serviceable Available Market if all of Michigan's winter wheat acres were enrolled in the SOW program. With 60,300 acres of winter wheat, the state's Southeast region has the most winter wheat acres outside of central Michigan. After the Southeast, there is a steep drop in planted acreage, with the Southwest region planting just 14,900 acres. Though these two regions have much less acreage than the central regions, expansion opportunities exist due to the presence of major commercial grain mills in the area. For example, the Southwest region hosts three major grain mills: Knappen, located in Augusta; King Flour in Lowell; and Mennel Milling in Dowagiac.

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## **Total Addressable Market - Midwest Region**

The geography of wheat production and the administrative task of running the SOW program make Midwestern states a logical next step in scaling the program. **Appendix C** demonstrates that the Midwest is a hotspot for winter wheat production. In 2023, Illinois (880,000 acres planted in 2023), Missouri (860,000 acres), Ohio (650,000 acres), and Indiana (440,000 acres) will lead the Midwest in winter wheat production. Another area of interest is the Great Lake state of Wisconsin, which planted 290,000 acres of winter wheat in 2023 (USDA, 2023).

To continue expanding the SOW program by leveraging grain mills as channel partners, TNC could recruit mill operators active in the states mentioned above. For example, Mennel Milling, previously mentioned for its mill in Dowagiac, Michigan, collects and mills 870,000 acres of wheat, corn, and soy from 2000 farmers across Indiana, Illinois, and Ohio. In Wisconsin, ALCIVIA operates 17 mills focused on wheat, corn, and soy, providing multiple market entry points (ALCIVIA, n.d.).



# DELIVERABLES

## Stakeholder Interview Summary

We interviewed stakeholders in four significant groups across the wheat value chain from harvest to end product: (1) farmers participating in the program, (2) Star of the West, (3) CPGs and retailers, and (4) state government agencies. We conducted in-depth interviews throughout the summer months to gather insights from these stakeholders. The stakeholder interview summary is organized by a stakeholder group using a stakeholder map, as illustrated in **Figure 5**.



*Figure 5: “Cultivating Success” Project Stakeholder Map*

The logos of our stakeholders are included below. **Figure 6** summarizes major themes across the stakeholder groups, which is followed by critical insights for each stakeholder group.



Source: Logos are from company or organization websites.

Stakeholder Group	Theme	Possible Action
<b>Saginaw Bay Watershed Farmers</b>  <b>Wheat Growers / Farmers</b>	Current financial incentives are not adequate for growers/farmers.	Explore direct financial incentives and complete pricing analysis to identify the optimal incentive.
	The data burden and lack of technological expertise among growers/farmers are significant.	Provide support and data training for growers/farmers through the SOW program.
	Additionality is a significant challenge for growers/farmers.	Remove additional requirement to expand farmer eligibility.
<b>Star of the West Milling Company</b>  <b>Wheat Processor</b>	The biggest challenges are data burden, MRV, and farmer compensation from CPGs.	Explore the use of technological tools like Truterra and build buy-in with CPGs.
	The program can be expanded to other crops through Star of the West's customer base.	Focus on wheat first, followed by dry beans and food-grade soybeans.
	Star of the West needs the program to be profitable, which requires hiring staff and financial support from customers.	Utilize the USDA Climate Smart Commodity Grant for increased staff and funding.
<b>Consumer Packaged Goods (CPG) Companies</b>  <b>Wheat Buyer</b>	MRV is essential to CPGs for sustainable agriculture programs.	Adjust the SOW program to be more MRV-focused.
	CPGs value their partnership with Star of the West and the growers and understand the importance of sustainable agriculture.	Include program attributes to help CPGs build relationships with growers.
	Each brand has specific sustainability goals and varying buy-in for a financial incentive.	Identify a standard financial incentive by region that many CPGs can agree on.
<b>Michigan Department of Agriculture and Rural Development (MDARD)</b>  <b>State Governmental Agency</b>	The current financial incentive to growers is not enough for widespread change.	Increase financial incentives to cover the burden of sustainable agriculture practices.
	Farmers need recognition and other non-financial incentives for sustainable agriculture practices.	Recognition tools and other incentives should be included in the SOW program.
	Focus on measurable environmental outcomes per unit of production.	Emphasize MRV, farm resilience, and profitability to increase program participation.
<b>The Nature Conservancy (TNC)</b>  <b>SOW Program Manager</b>	Partnership with Star of the West is critical for the success of the SOW program.	Work closely with Star of the West to re-design the program and explore the feasibility of a program transition.
	MRV must be incorporated and built in to create a more sophisticated program.	Increase the financial incentive to farmers and integrate an MRV-based model and practices.
	Future iterations of the SOW program will require more funding, staff, and support from external TNC partners.	Develop program sophistication to attract funding via Climate Smart Commodity Grant, RCPP, or a CPG program sponsor.

**Figure 6: “Cultivating Success” Major Themes Across Stakeholders Groups**

Source: Stakeholder interviews and Dow Fellows team analysis, 2023.

# DELIVERABLES



## Saginaw Bay Winter Wheat Value Chain

The national wheat value chain features high levels of vertical integration, with a few massive incumbents making up ~20% of the market share and thousands of mom-and-pop operations making up the remaining 80%. The Michigan Wheat value chain is vertically integrated like the national wheat market. Partners across the winter wheat supply chain include stakeholders from farmers and grain processors to the grain buyer and sustainability collaborator. **Figure 7** depicts the members of the Michigan winter wheat value chain.



**Figure 7:** *The Michigan Winter Wheat Value chain from Farmer to Sustainability Collaborator, (TNC, 2023).*

### Sustainable Wheat Option (SOW) Program Participants (Saginaw Bay Watershed Wheat Growers)

Our team interviewed six farmers participating in the SOW program. Formal and informal interviews occurred at a TNC-sponsored farmer enrichment workshop, a site visit to multiple farms, and the Conservation Technology Information Center (CTIC) conference. While some farmers praised the program's value and support, others needed help with data privacy and ownership concerns. Growers seek better compensation but also acknowledge the role of improved soil health, fuel savings, and wheat quality. Expanding to other crops like sugar beets and soybeans holds promise but requires sufficient financial incentives and engaging communication to attract broader participation.



# DELIVERABLES



## Key Learnings for the SOW Program from Growers / Farmers

### 1. Challenges & Needs

- Low financial incentives (\$4/acre) are insufficient to adopt new practices.
- A data collection burden exists, and farmers lack compensation for it.
- Resistance to change among older farmers exists, especially for practices like no-till.
- Lack of clarity on benefits for early adopters implementing sustainable practices.
- There is little consensus among farmers on what sustainable agriculture means.

### 2. Program Experience

- There are mixed opinions on the program's value, ranging from "model from heaven" to "not worth the data entry."
- The farmers appreciate the program's support and learning opportunities.
- Farmers have data privacy and ownership concerns, especially with increasing demands from multiple programs.

### 3. Key Motivators

- Financial incentives are the primary motivator, but current levels still need to be improved.
- Other benefits include improved soil health, fuel savings, and wheat quality.
- A sense of pride and contribution to sustainability goals motivate some.

### 4. Preferred Payment Structure

- To avoid yield dependence, farmers prefer per-acre compensation rather than per bushel. A few farmers specifically mentioned \$50/acre as sufficient.
- Farmers are open to alternative options, such as tax breaks, seed discounts, or crop insurance benefits, and they value the stability of incentives.

### 5. Future of the SOW Program

- **Crop Expansion:** Interest in expanding the program to crops like sugar beets and soybeans.
- **Financial Incentive:** Willingness to explore additional practices with sufficient financial incentives.
- **Training:** Emphasis on the need for more engaging onboarding and communication to increase participation.
- **Stackability:** Emphasis on the importance of stackability, or the allowance of including multiple acres in other programs, for program viability in the future.



**Grower Learning #1:** The current financial incentive is not enough.

**Grower Learning #2:** The data burden of sustainable practices is a major challenge.



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## Star of the West Milling Company (Wheat Processor)

Throughout the year, we interviewed several Star of the West employees, including Lisa Woodke, the Sustainability Director, and a team of grain merchants. While the SOW program shows promise for scaling, numerous challenges hinder its current expansion. Star of the West's potential takeover necessitates external funding solutions like USDA grants or carbon credit programs to ensure program sustainability and success.

## Key Learnings for the SOW Program from Star of the West

### 1. Scalability

- The SOW program can be scaled to other crops. Focus on wheat first: It makes up 65% of Star of the West's business, followed by dry beans and food-grade soybeans.
- Many sustainable agriculture projects need a larger volume for mass production at the grain mill and elevators. Additionally, specifications for sustainable wheat products must be customized to CPG customers, which adds complexity.

### 2. Market Drivers

- **Customer Demand for Sustainable Practices:** CPG customers increasingly seek environmental outcomes and social impact from their suppliers.
- **Financial Premium:** Star of the West sometimes finds it challenging to get CPGs to pay a premium for sustainable wheat products.
- **Labeling:** Agricultural certification labels become divisive in the farming community. Many farmers and wheat processors perceive that if a farmer does not have a label on their product, then everyone thinks they also do not participate in sustainable agriculture practices (per the Star of the West Sales & Marketing Team).

### 3. Challenges of the SOW Program

- **Data Sharing and Compensation:** Growers want compensation for sharing environmental data, but CPGs are not currently paying for it.
- **Standardization:** Lack of standardized approaches and systems across CPGs confuses growers.
- **Technological Barriers:** Many growers need more technology and expertise for data collection.
- **The Burden on Growers:** Data collection and MRV are seen as time-consuming and effortful.
- **Financial Incentives:** Growers require more financial compensation to justify adopting new practices.
- **Additionality:** The program's additionality requirement is difficult for growers. Growers are mainly focused on the cost and impact of various agricultural practices.



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## Key Learnings for the SOW Program from Star of the West (continued)

### 3. Challenges of the SOW Program:

- **Pricing:** The SOW program must sell at the same premium price as dictated by the Chicago Board of Trade (per the Star of the West Sales & Marketing Team). This pricing limits the potential financial incentive Star of the West can provide farmers.
- **Brand recognition:** TNC currently needs better brand recognition with growers in the Saginaw Bay Watershed. Many farmers see the SOW program as "anti-farming" and "pro-nature."

### 4. Barriers to Star of the West's Ownership of the SOW Program

- **Profitability:** Star of the West emphasized that their organization needed help managing the SOW program profitably. This program's profitability is vital.
- **Funding:** Therefore, if Star of the West took on program management, a USDA Climate Smart Commodity grant would be essential for funding the program. Additionally, Star of the West would only manage the program with financial support from their customers.
- **Data Burden:** This grant could fund the development of Truterra and Cropwise, technological tools that assign each field a sustainability score. Field identification and the data burden are Star of the West's most challenging pain points. The grant can also help determine how much CPGs will pay for an agricultural incentive program.
- **Outcomes-Based:** Star of the West suggested another option: enroll growers in a payment-for-outcome program like carbon credits.
- **Additional Staff:** Managing the SOW program would also require Star of the West to hire additional team members to expand their team, as they need more staff to manage the complexities of the program today. This new staff would be a significant cost to Star of the West.
- **Internal Incentive Structure:** Star of the West's incentive structure does not include an incentive or bonus for sustainability goals but a bonus for sales goals. Internal organizational incentive shifting will be needed to gain support for managing the SOW program and other sustainable agriculture initiatives.



**Processor Learning #1:** The data burden is the highest challenge for Star of the West.

**Processor Learning #2:** The program must be feasible for Star of the West to take on program management.

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## Consumer Packaged Goods (CPG) Companies (Wheat Purchaser)

We spoke to stakeholders in various roles within CPGs, from Responsible Sourcing leads to Brand founders. Their roles were embedded in procurement and strategy, spanning control of single products to international supply chains. Many CPGs mentioned a direct relationship with Star of the West, not just as a supplier but as the facilitator for sustainability initiatives. One company shared that Star of the West is an “essential milling partner integral to its company’s launch. One interviewee mentioned that in partnering with TNC, they have found a space where both parties are members of industry collectives.

## Key Learnings for the SOW Program from CPG Companies

### 1. CPG Sustainability Priorities:

- CPGs value their partnership with Star of the West for sourcing and sustainability initiatives.
- Soil carbon, carbon farming, and emission reductions are key focus areas.
- Measurement, Reporting, and Verification (MRV) of environmental impacts is essential.

### 2. Challenges:

- **MRV Emphasis:** Data collection, monitoring, and reporting pose significant burdens for CPGs.
- **Farmer Connections:** Building relationships with farmers is crucial for program success.
- **Financial Incentives:** Reluctance to increase financial contributions without precise measurement and benefits.

### 3. Opportunities:

- **Pre-competitive Collaboration:** CPGs are open to sharing findings and learnings.
- **Broad and Impactful Sustainability Initiatives:** Consumers are increasingly interested in product sourcing ethics and sustainability, not necessarily specific farms.
- **Brand-specific Sustainability Goals:** Different brands have varying prices. For example, within WK Kellogg’s (formerly Kellogg’s), a sustainable agriculture initiative is more likely to succeed with Kashi than Pringles due to product price.

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**Buyer Learning #1:** CPGs value sustainable agriculture, farmers, and Star of the West.

**Buyer Learning #2:** CPGs require MRV in order to increase the financial incentive for growers.



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## Michigan Department of Agriculture and Rural Development (MDARD) (State Government Agency)

We spoke with representatives from MDARD, including Director Dr. Tim Boring. Wheat is a valuable crop for Michigan, and MDARD supports the SOW program but believes that identifying the right economic incentive for farmers is essential. Furthermore, the agency stresses that an environmental outcomes-based model is the best path forward for program success and farmer adoption of sustainable agriculture practices.

### Key Learnings for the SOW Program from MDARD

#### 1. MDARD Strategic Priorities

- MDARD believes that anyone working in agriculture is self-motivated to make it more sustainable and that the government should have as little control and influence as possible.
- **MDARD's Overall Goals**
  - Encouraging food processors in Michigan to purchase more Michigan products
  - Diversify crops grown in Michigan to avoid crop monopolies.
  - Increase specific agricultural practices such as reduced fertilizer requirements and water preservation.
- **MDARD's Main Concerns Moving Forward**
  - Avoid creating divergent food systems that exacerbate food insecurity.
  - Determine the connection between our food and our healthcare system.

#### 2. SOW Program Feedback

- **Program Direction:** MDARD supports the overall model but sees issues with incentives and farmer adoption.
- **Financial Incentives:** TNC's current offer must be revised to accommodate widespread change. Farmers need compensation for the additional burdens of sustainable practices.
- **Farmer Behavior:** Recognize that farmers may not solely follow economic rationality. Farmers also need compensation beyond financial, such as recognition.
- **Labeling:** Ineffective as an incentive. Focus on measurable environmental outcomes per unit of production.
- **Long-term Benefits:** Emphasize farm resilience and profitability through sustainable practices. Link resilience to self-reliance and reduced dependence on external companies.

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**MDARD Learning #1:** MDARD supports the SOW Program and sustainable agriculture.

**MDARD Learning #2:** The financial incentive is not enough for farmers. Consider other incentives.

# DELIVERABLES

## Comparative Cases

Conservation is becoming an increasingly important factor in agriculture. It has led various stakeholders, including traditional conservation groups, government parties, and CPGs, to partner with farmers to better market their support for sustainable agriculture. To provide well-informed recommendations to TNC on this growing market, our team compared various domestic and international programs that offer technological and economic incentives for farmers to incorporate practices that either reduce or actively remove greenhouse gasses from the atmosphere, increase biodiversity, or provide other environmental benefits to the local community.

The "Payment for Practice" categorization illustrated in **Figure 8** is a compensation model in which farmers are paid for implementing conservation practices, often at a flat rate per acre or project (Soil and Water Outcomes Fund, 2022). This structure is the model of TNC's SOW program, as it features a set price per bushel of wheat grown on acres enrolled in the program. "Payment for Outcomes" is another model in which farmers are compensated based on the volume of environmental improvements produced each year, such as carbon credits (Soil and Water Outcomes Fund, 2022). This model is used in most carbon credit-based models, such as the Soil and Water Outcomes Fund, which secures a credit buyer before enrolling a farmer into their program. There is often variation in payments, as seen in the Sustainability Incentive model from Arla, which allows farmers to earn credits for additional practices implemented on their farmland (Arla Foods, 2022). However, payment for outcomes often requires a higher administrative burden to determine the exact impact of agricultural practices.

Most programs advertise themselves as increasing farmers' profitability beyond immediate financial incentives and tout anticipated environmental benefits. Multiple programs, such as Campbell's Soup Co.'s wheat sustainability program and the Danone and General Mills' regenerative agricultural pilots, highlight intensive data collection methods and technological support as critical elements of their programs. There is significant evidence that CPGs support sustainability initiatives to help reach their environmental targets throughout the supply chain.

**Figure 8** below summarizes our secondary research on the various comparative programs to the SOW program.

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## Comparative Cases

Program Name	Collaborators	Geography	Crops	Acres Enrolled (As of 2022)	Incentive For Farmers	Payment Model	Funding
Sustainable Option Wheat	The Nature Conservancy (TNC), Star of the West (SOW)	Michigan	Wheat	6,502	\$0.08 - 0.17/bushel	Performance	\$250K
Campbell Soup Co. Wheat Sustainability Program	Truterra, Heritage Cooperative, Mercer Landmark Co., TNC, SOW, The Mill	Ohio, Maryland, Pennsylvania	Wheat	108,000	Equips farmers with unspecified tools; financial consulting \$0.20/bushel	Outcomes	Undisclosed
General Mills	General Mills, ADM, Ecosystem Services Market Consortium	Kansas	Wheat	17,000	Free consultation from Understanding Ag Free Agrible app	Outcomes	\$3M+
DIGIORNO® wheat Supply Chain Initiative	Nestlé, ADM, Ardent Mills	Kansas, North Dakota, Indiana, Missouri	Wheat	100,000	Technical resources and unspecified financial support	-	Undisclosed
Soil and Water Outcomes Fund	Cargill, Nutrien, Ingredion, BASF, Ohio Corn & Wheat, PepsiCo, American Farmland Trust, ETC.	Ohio	Wheat, Soy, Corn	240,000	\$31-35/acre	Outcomes	\$18.5M
Harmony Ambition 2030	Mondelēz European partners	EU	Wheat	140,850	Technical assistance	-	Undisclosed
InGrained	Kellogg's, Syngenta, Kennedy Rice Mill, Supreme Rice and Regrow Ag	Lower Mississippi River Basin	Rice	Undisclosed	\$20/ T CO2e abated	Outcomes	\$2M
CROPP Carbon Insetting Program (CCIP)	Organic Valley member-farmers	Global	Dairy	Undisclosed	\$20/ mT CO2e sequestered or reduced	Outcomes	\$25M
Growing Roots	General Mills, ALUS	North Dakota, Canada	Oats	50,000	Undisclosed technical and financial assistance	-	\$2.3M
Danone NORAM	Sustainable Environmental Consultants, rePlant Capital, National Fish and Wildlife Foundation, Soil Health Institute, Green America, Cornell University	USA, Canada	Dairy, Corn, Oats, Wheat, Barley, Alfalfa, Soy, Almonds	144,771	NRCS grants +30% match from Danone	Performance	\$23M

**Figure 8: Comparative Cases Diagram - Comparison of Sustainable Agriculture and Ranching Incentive Programs based in the United States and Europe.**

Source: Company and organization websites, 2023.



# RECOMMENDATIONS



Our recommendations for TNC focus on the following main themes over three time periods:

## **Implement Program Improvements in the Final Pilot Year (Short-Term, 1 year)**

We recommend integrating the learnings and feedback from the SOW program stakeholders, including enrolled farmers, Star of the West, and CPGs. Using this feedback, complete a pricing analysis to determine the optimal incentive price for SOW program stakeholders.

## **Explore Program Enhancement in the Next Grant Process (Medium-Term, 2 - 3 years)**

We recommend adjusting the program design to be outcomes-based and Measurement, Reporting, and Validation (MRV) focused, following the examples outlined in the included comparison study. This transition would require TNC to change the terms of its agreement with HSBC for the grant to remove its additional requirement for farmers and explore alternative incentives.

## **Fortify Program for Maximum Scale and Success (Long-Term, 4 - 6 years)**

To create a strong and resilient food system in Michigan, TNC should prioritize local mill operators by continually growing their community partnerships. We recommend broadening the program to additional crops, primarily soy and corn, and utilizing USDA funding for climate-smart commodity agricultural incentive programs.

**Figure 10** summarizes the key insights and subsequent recommendations for each stage.



**Figure 9:** “Cultivating Success” Dow Fellows Team and Clients

*Pictured (L to R): Jacob Kennedy, Joel Leland (TNC), Madison J. Parrish, Emily Alexander, Ben Wickerham (TNC), TK McKenzie, and Maya Côté.*

# RECOMMENDATIONS

Period	Insight / Challenge	Recommendation
<b>Short Term</b> <b>(1 year)</b>  <b>Focus:</b> <b>Learn &amp; Adjust</b>	Limited community collaboration due to the short pilot program.	1. Integrate learnings and feedback from SOW program stakeholders in 2024.
	Lack of optimal incentive price per wheat bushel.	2. Complete a pricing analysis to determine the optimal incentive price for all stakeholders.
<b>Medium Term</b> <b>(2 - 3 years)</b>  <b>Focus:</b> <b>Standardize &amp; Expand</b>	Inconsistency with industry-standard measuring system.	3. Adjust program design to be outcomes-based and MRV-focused.
	Strict grant requirements make it challenging to enroll more farmers into the program.	4. Adjust the HSBC grant to alter additionality requirements to expand program eligibility.
	Low participant retention rates.	5. Explore alternative incentives for farmers.
<b>Long Term</b> <b>(4 - 6 years)</b>  <b>Focus:</b> <b>Scale &amp; Adapt</b>	Scalability requirement to strengthen mill operators and farmers.	6. Continue building strong relationships with Central and Southwest Michigan mill operators.
	Remain competitive with national incentive program alternatives.	7. Consider corn and soy as the subsequent crops for program expansion to focus on carbon emissions reductions.
	Need for alternative funding with less strict eligibility requirements.	8. Utilizing USDA grant funding and other potential funding models.
	Wheat Processor needs to be the program's central owner to build a resilient food system.	9. Ensure feasibility for successfully transitioning the SOW program to Star of the West.

**Figure 10:** “Cultivating Success” Project Recommendations Summary

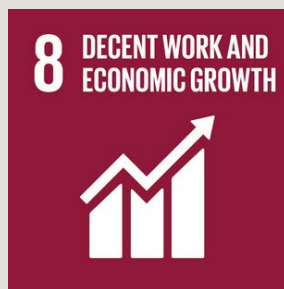
# PROJECT IMPACT

## SOW Pilot Program Current Results

The SOW program’s success metrics include total farmer enrollment, involved acreage, and estimates of GHG emissions reduced. This report contributes to TNC’s knowledge of the feasibility, scalability, and successful aspects of the program. Ultimately, this information will be used in a “playbook” generated by TNC that other grain processors could use in the future. The program has 6,502 enrolled acres, aiming to reach 12,000 by its third year. Acreage goals throughout the program have been based on HSBC funding provisions and Chicago Commodity Exchange prices. Currently, most farmers are receiving \$0.08/acre based on their achieved tier within the program. For year three, sixteen more farms have enrolled in the program, bringing the total enrollment to 20 farms for the 2024 enrollment year. Their estimates suggest that the Sustainable Wheat Option Program has contributed to ~ three gigatons of CO2 avoided or reduced.

## United Nations Sustainable Development Goals

The Sustainable Development Goals (SDGs) addressed in this report are #8: “Decent Work and Economic Growth,” #12: Responsible Consumption and Production, and #15: “Life on Land.” The USDA has studied the connection between agricultural productivity and decreased food security to affect regional income levels and community well-being potentially (USDA, n.d.). However, increasing productivity through traditional industrial agricultural methods is not sustainable, resulting in polluted waterways, decreased soil quality, and contributed to greenhouse gas emissions. This finding is why we have utilized the principles allied with SDG #12, which specifically seeks to reduce the associated organic and water waste created through intensive agricultural practices (UNDP, n.d.). By establishing an economy that utilizes resources efficiently, local communities will become more resilient within the economic and farming sectors.



Source: Logos are from United Nations organization website.

# CONCLUSION

TNC will use our deliverables to contribute to a more extensive report on the viability and feasibility of the SOW. In our analysis, we outline how TNC may adjust the program strategy and parameters to optimize the program's success or inform similar programs in the future. We also provided the program's potential scalability and growth opportunities and suggested possible directions for seeking future funding opportunities. TNC is about to enroll 16 new farms, bringing total enrollment to 20. These farmers could continue with the program's next iteration with adjustments to the participation parameters and additionality requirements.

With this report, we have outlined the scalability of future wheat incentive programs within Michigan and the Midwest and proposed our impression of the project's feasibility. Ultimately, we recommend that the project be redesigned to include more concrete, measurable outcomes so that CPGs are interested in partnering with the program and farmers receive more valuable incentives to reinforce and build a resilient food system across the United States and beyond.

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## **Our Clients**

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Joel Leland, Conservation Associate, Saginaw Bay, The Nature Conservancy  
Lisa Woodke, Sustainability Director, Star of the West Milling Company

## **Our Project Advisor**

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## **Our Stakeholder Interview Participants**

All Saginaw Bay Watershed area farmers, Tim Boring, the MDARD, Star of the West staff team, and our CPG brand representatives.

## **The Graham Institute and Dow Fellows Staff**

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## **The Dow Company Foundation**

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**Figure 11:** “Cultivating Success” Dow Fellows Team and Clients

*Pictured (L to R): Joel Leland (TNC), Ben Wickerham (TNC), Lisa Woodke (SotW), Emily Alexander, Madison J. Parrish, Jacob Kennedy, Maya Côté, and TK McKenzie.*

*Location: Star of the West Milling Company, Frankenmuth, MI*



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# APPENDICES

## Appendix A: “HSBC Nature-Based Solutions Sustainable Option Wheat (SOW) Program” Sustainable Practices Program Criteria

Program Criteria <sup>1</sup>	Qualifications	Responsible Party
1. Tracking	Online Tracking: Growers self-report operational information when possible	Growers Input for <i>AgriEdge</i> Star of the West inputs for <i>Truterra</i>
2. Edge of Field Risk Evaluation	Evaluation of the whole farm, plan in place for high-risk areas <sup>2</sup>	TNC
3. Cover Crops	Cover field w/ min. 1 species, 3 out of 4 years.	Verified in the field by SotW, outcomes assessed in the tool
4. Crop Diversity	Plants a minimum 3 crop rotation	Tracked in tool
5. Nutrient Management	<p>Ensure the NMP/CNMP/Fertility plan is in place and that it:</p> <ul style="list-style-type: none"> <li>• Is based on current soil testing</li> <li>• Follows 4R and university recommendation</li> <li>• NRCS 590 approved or equivalent<sup>3</sup></li> </ul> <p>Additional NM activities:</p> <ul style="list-style-type: none"> <li>• Variable rate application</li> <li>• Subsurface or placement when possible</li> <li>• A portion of nutrient inputs come from manure/compost sources</li> <li>• Use of N Stabilizers/Slow Release</li> </ul>	Plans verified by SotW + in-field spot checks for QA/QC, outcomes assessed in tool
6. Reducing Tillage	<ul style="list-style-type: none"> <li>• No-Till/Strip-Till or</li> <li>• Plan to reduce tillage annually with the ultimate goal of no-till/strip-till. Continual improvements will be assessed based on residue results from the prior year.<sup>4</sup></li> </ul>	Verified in the field by SotW, outcomes assessed in the tool
7. Integrated Pest Management	<ul style="list-style-type: none"> <li>• Participants will document their IPM activities or</li> <li>• If IPM practices are not utilized on the farm, enrollment in IPM planning service will be necessary.</li> </ul>	Plans verified by SotW + in-field spot checks for QA/QC, outcomes assessed in tool

Source: The Nature Conservancy, Michigan Chapter, 2023.

# APPENDICES

## Appendix B1: Michigan Winter Wheat County Estimates, December 2022



United States Department of Agriculture  
National Agricultural Statistics Service  
Great Lakes Region



### County Estimates

December 16, 2022

#### Michigan Winter Wheat County Estimates 2022

County and District	Planted <i>Acres</i>	Harvested <i>Acres</i>	Yield <i>Bushels</i>	Production <i>Bushels</i>
<b>20 NORTHWEST</b>				
GRAND TRAVERSE	1,200	1,070	58.2	62,300
<b>30 NORTHEAST</b>				
OGEMAW	2,600	2,320	69.0	160,000
OTSEGO	1,000	890	62.0	55,200
PRESQUE ISLE	3,400	3,120	59.6	186,000
<b>40 WEST CENTRAL</b>				
MASON	4,400	4,020	63.2	254,000
MUSKEGON	3,000	2,660	71.1	189,000
NEWAYGO	3,200	2,940	73.5	216,000
OCEANA	2,800	2,560	60.5	155,000
<b>50 CENTRAL</b>				
GLADWIN	2,400	2,190	85.4	187,000
GRATIOT	18,000	15,600	85.6	1,335,000
MECOSTA	2,700	2,410	81.3	196,000
MONTCALM	14,300	13,000	74.2	965,000
OSCEOLA	1,400	1,250	58.9	73,600
<b>60 EAST CENTRAL</b>				
ARENAC	6,700	5,530	67.8	375,000
BAY	12,700	11,300	81.2	918,000
HURON	73,000	67,100	97.9	6,569,000
SAGINAW	15,100	13,800	82.6	1,140,000
SANILAC	47,500	44,500	91.4	4,067,000
TUSCOLA	30,600	28,500	82.2	2,343,000
<b>70 SOUTHWEST</b>				
ALLEGAN	6,400	5,450	84.0	458,000
CASS	1,500	970	60.9	59,100
KALAMAZOO	2,900	2,520	81.0	204,000
KENT	4,100	3,760	70.2	264,000

This figure is continued on the next page.

Source: USDA. (2022, December 16). County Estimates. USDA National Agricultural Statistics Service.



# APPENDICES

## Appendix B1: Michigan Winter Wheat County Estimates, December 2022, Continued

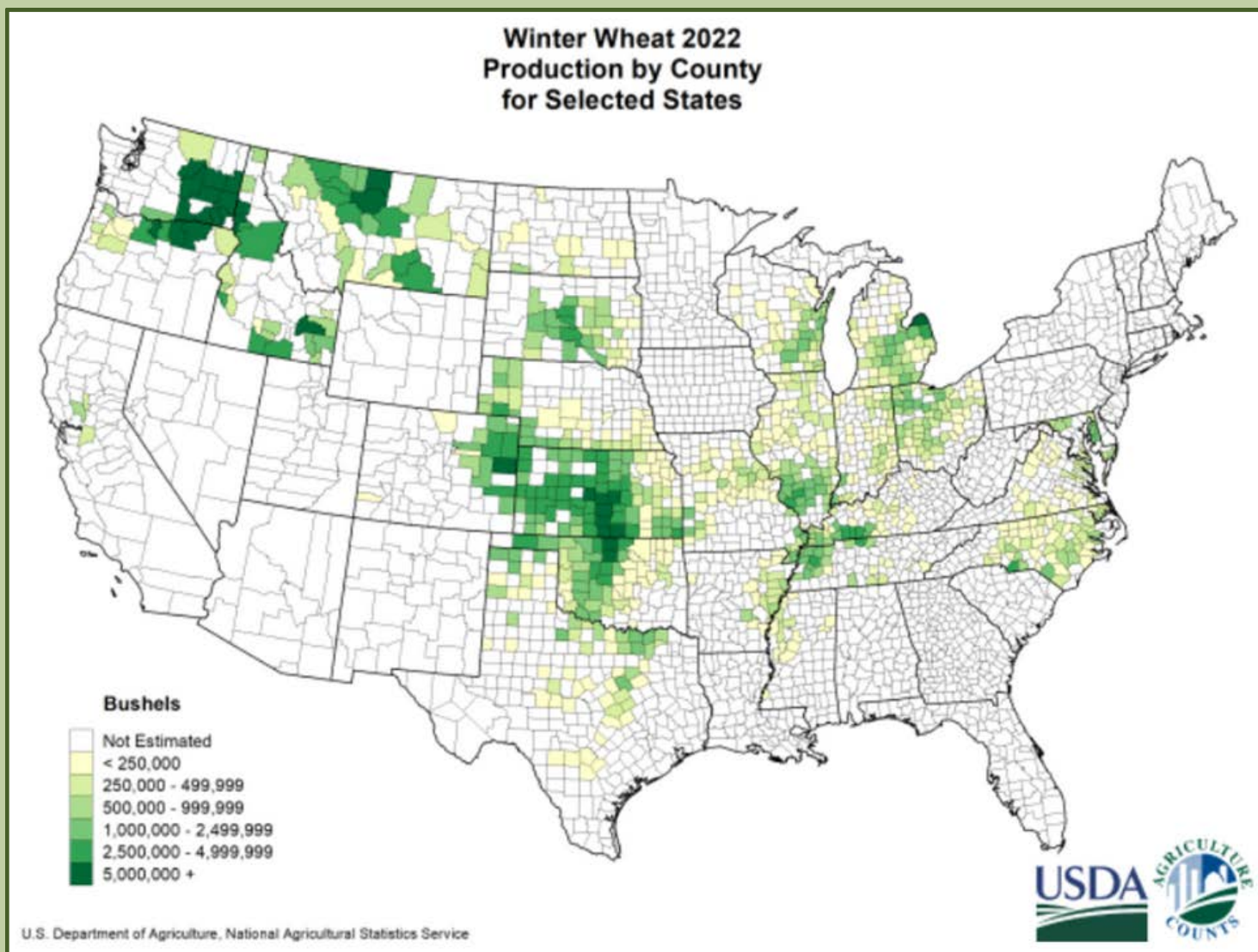
County and District (continued)	Planted	Harvested	Yield	Production
	<i>Acres</i>	<i>Acres</i>	<i>Bushels</i>	<i>Bushels</i>
<b>80 SOUTH CENTRAL</b>				
BARRY	7,100	6,490	80.9	525,000
BRANCH	2,800	2,500	73.6	184,000
CALHOUN	4,400	3,990	72.7	290,000
CLINTON	15,800	14,400	78.9	1,136,000
EATON	15,900	14,700	90.1	1,325,000
HILLSDALE	6,200	5,620	82.4	463,000
INGHAM	13,500	12,000	78.1	937,000
IONIA	12,500	11,300	77.7	878,000
JACKSON	7,500	6,690	78.0	522,000
ST JOSEPH	4,400	3,580	78.5	281,000
SHIAWASSEE	11,900	10,900	73.7	803,000
<b>90 SOUTHEAST</b>				
GENESSEE	2,400	2,130	76.1	162,000
LAPEER	4,800	4,400	76.4	336,000
LENAWEE	20,000	17,800	84.6	1,506,000
LIVINGSTON	4,900	4,480	72.8	326,000
MACOMB	1,200	1,000	79.4	79,400
MONROE	11,100	10,200	81.4	830,000
OAKLAND	700	640	69.5	44,500
ST CLAIR	5,700	5,090	90.8	462,000
WASHTENAW	9,500	8,700	85.7	746,000
OTHER COUNTIES	36,800	30,930	70.4	2,177,900
<b>STATE</b>	<b>460,000</b>	<b>415,000</b>	<b>83.0</b>	<b>34,445,000</b>

Source: USDA. (2022, December 16). County Estimates. USDA National Agricultural Statistics Service.



# APPENDICES

## Appendix C: US Winter Wheat Production 2022 by State, United States



Source: USDA. (2022). *Winter Wheat: Production Acreage by County*. USDA NASS.

# APPENDICES

## Appendix D: “Cultivating Success” Project Acronyms List

Abbreviations	Full Description
CO2e	Carbon Dioxide Equivalent
CPG	Consumer Packaged Goods Company
CROPP	Cooperative Regions of Organic Producer Pools
ERS	Economic Research Service
ESG	Environment, Social, and Governance
EU	European Union
GHG	Greenhouse Gas
HSBC	The Hongkong and Shanghai Banking Corporation Limited
IPM	Integrated Pest Management
MDARD	Michigan Department of Agriculture and Rural Development
MI	Michigan
MRV	Measurement Reporting Verification
NASS	National Agricultural Statistics Service
NM	Nutrient Management
NMP	Nutrient Management Plan
CNMP	Comprehensive Nutrient Management Plan
NORAM	Danone North America Regenerative Agriculture Program
RCPP	Regional Conservation Partnership Program
SAM	Serviceable Available Market
SDGs	Sustainable Development Goals
SOM	Serviceable Obtainable Market
SotW	Star of the West Milling Company
SOW	Sustainable Option Wheat
TAM	Total Addressable Market
TNC	The Nature Conservancy
UNDP	United Nations Development Programme
USDA	United States Department of Agriculture