Title:

# Documenting and analyzing crop insurance participation in counties with Socially Disadvantaged Farmers and Ranchers (SDFRs)


| | |
|---|---|
| **Submitter:** | Ana Claudia Sant'Anna |
| **Contact information:** | 4411 Agricultural Sciences Building<br>PO Box 6108<br>Morgantown, WV 26505-6108<br>Phone: (304) 293-4832<br>Fax: (304) 293-3740<br>Email: anaclaudia.santanna@mail.wvu.edu |



| | |
|---|---|
| **Year awarded:** | 2024 |
| **Total amount funded:** | $64,790.00 |
| **Research study period:** | (07/31/2024, 07/31/2025) |
| **Reporting period:** | January 2025 |
| **Due date of report:** | 02/27/2025 |
| **Submission date:** | 02/27/2025 |
| **Organization to which report is submitted:** | Socially Disadvantaged Farmers and Ranchers Policy Research Center |
| **Policy Research Analyst:** | Kara Woods |

Abstract:

## Primary data collection continues, summary statistics analysis

Ana Claudia Sant'Anna
*West Virginia University*

The research aims at understanding the adoption of crop insurance by Socially Disadvantaged Farmers and Ranchers (SDFR). The study will: 1) document and explore the correlations between the presence of SDFRs in a county and crop insurance participation; 2) quantify the explanatory power of county-level measures, such as producer race, gender and ethnicity on crop insurance misrating. In February we worked on summary statistics. We also collected and sent out survey requests to farmers in the African American farmers in the index list. We prepared short presentations to farmers at a meeting in North Carolina and in West Virginia. We continued to work on the econometric model.

Summary of Research Study Progress

Overall, the research goal is to understand the adoption rate of crop insurance by Socially Disadvantaged Farmers and Ranchers. Objectives are two-fold: 1) document and explore the correlations between the presence of SDFRs in a county and crop insurance participation; 2) quantify the explanatory power of county-level measures, such as producer race, gender and ethnicity on crop insurance misrating. We will use secondary as well as primary data in our analysis. Aims related to milestone 1 from July to September were mostly completed. We are still working on the data collection and literature review. Milestone 2, running from October to December involved data analysis and data cleaning. In February we performed some data analysis and have started working on the coding for the econometric analysis. We prepared slides for outreach activities with farmers at conferences in North Carolina, presented by Kara, and in West Virginia.

Past research indicates that beginning farmers are more common among SDFRs and in regions with smaller farms (Ahrendsen et al. 2022). Teal and Stevens (2023) asn well as Hendricks et al. (2024) find evidence of inequality in government programs. Preliminary data analysis of the 2022 Ag Census shows that there are more white producers and number of operations than any other SDFR. Hispanic producers have the youngest average age. Larger farms are the ones with most acres insured, around 60%. Counties with a larger share of SDFRs have the lowest amount of insurance policies purchased. Slides are available on this in the appendix.

Research Methods

This study will adopt a descriptive analysis and a quantitative approach. The methodology includes the following steps: 1) the collection secondary data at the county level, pre and post the 2018 Farm Bill, on crop insurance expenses, premium and loss ratios from the Risk Management Agency, as well as historical yield data from NASS and, demographic data on SDFRs from the Census of Agriculture; 2) the use of statistical methods to analyze the data and identify relationships between SDFR counties and crop insurance participation; 3) the use of spatial econometric models to analyze county-level data on crop insurance loss ratios, premiums, and SDFR demographics.

Secondary data will be collected from the US Agricultural Census 2022 and the USDA's Risk Management Agency (RMA) Summary of Business, the National Agricultural Statistics Service (NASS), as well as, the 2017 and 2022 US Census of Agriculture. Key variables collected will include county-level crop insurance data, yield data, coverage level choices, revenue plan participation, group plan participation, and the ratio of downside yield deviations across sample periods, number of principal producers by race, sex, age and experience, county-level data on farm characteristics (e.g. farm size and crop type). While data from the US Agricultural Census is only available in 2017 and 2022, data from the RMA is available yearly.

With the data collected we will create a comprehensive panel dataset highlighting a period before and after the 2018 Farm Bill, allowing for an initial descriptive analysis to identify trends and patterns for interpretation within the context of the 2018 Farm Bill provisions. This can be accomplished through line and bar graphs. We will also use descriptive statistics such as means, standard deviation, growth rates, minimum and maximum to analyze the data variation and range. This will allow us to identify any periods of anomaly in terms of the crop insurance participation over the years. We also plan on displaying the information on crop insurance participation in a map to allow for an analysis of the distribution of payments across the US. A significant limitation of our research is that we do not have individual level information and can only make inferences at the county level. As such we can only comment on crop insurance adoption at the county level. As such this will be complimented by primary data collected from farmers through an online survey.

The collected data is further analyzed through the following empirical estimation. We follow the methodology proposed by Teal and Stevens (2024) and expand it to include all SDFRs. Teal and Stevens (2024) only consider African American farmers, we propose also considering Hispanic, Asian, Native American, female farmers, as well as interactions between these to account for female African American farmers for example. The dependent variables in our model will be the county-level crop insurance loss ratio ($LL$), defined as the ratio of indemnities to premiums. The independent variables will include a set of county-level systematic factors ($XX$) such as historical yield trends, yield variability, coverage level choices, revenue plan participation, group plan participation, and the ratio of downside yield deviations across sample periods. Additionally, we will include variables representing the share of different SDFR groups in the county. The spatial econometric model, which contains a spatial lag to account for spatial dependence can be represented as:

$$\text{LR} = \rho WL + X\beta + u \qquad (1)$$

where LR is the expected loss ratios, $\rho\rho$ is the spatial autoregressive coefficient, W is spatial weights matrix the X a matrix of independent variables, $\beta$ is a vector of parameters, and u the error terms. Separate estimations of equation (1) will be run for different types of crops mostly grown by SDFRs. We also plan on running equation (1) using other dependent variables such as crop insurance expenses. Estimations will be conducted with data pre- and post the 2018 Farm Bill to identify any changes in the interpretation of results. This estimation procedure is not without limitations. We are unable to identify if crop insurance premium misratings are beneficial or not to SDFRs. Estimation results do however allow us to identify whether the proportion of SDFRs in a county is related to crop insurance loss ratio. If discrimination is not present, then these would not be related, and the coefficient would be statistically insignificant. Results from the empirical estimation and descriptive data analysis will be provided in a report which will include recommendations to policy makers. Visualization will be provided in the form of fact sheets and similar outreach material.

We aim at increasing response rate of the surveys by sending out multiple opportunities for farmers to answer. We will also have the QR code available at various conferences attended by farmers and farm operators to increase participation. We will be counting with the help of the Socially Disadvantaged Farmers and Ranchers Policy Research Center to reach out to farmers.

Research Study Participants

Study participants are US farmers.

Publications

Slides for outreach presentation.

Key Personnel

Dr. Ana Claudia Sant'Anna, the principal investigator, will supervise the tasks performed by the graduate student (e.g. data collection, survey design and initial analysis), perform econometric estimations, review deliverables and, take the lead in drafting and editing the final report.

Stipend: $16,094.00 and Fringe Benefits: $3,702.00

Ranjita Bhandari will work as a graduate research assistant. Her main tasks are survey design, data collection, data cleaning and descriptive analysis, assisting in the report draft and preliminary analysis of econometric modelling. Ranjita is currently a PhD candidate in the School of Community and Economic Development at West Virginia University. She has experience in statistical analysis, data collection and cleaning, SDFRs, and in estimating empirical models. Below related work and presentations were highlighted, please see her CV in Appendix A for the complete information on past and present research.

Stipend: $20,700 (Fringe Benefits: $1,864.00) and Summer Salary: $4,198 (Fringe Benefits: $378)

Changes

We included having a table at the WV Women in Agriculture conference to get farmers to fill out our survey.

Problems

Low response rate for the survey. We plan to keep reaching out to potential respondents to increase response rate.

Financial Statement

No deviations in costs and budget to report. Expenditures for this period include travel expenses to the WV Women in Ag Conference, Graduate Research Assistant Funding and Supplies. For amounts, including direct and indirect expenses, please refer to the financial table.

Research Study Status

The overall study is progressing well. We plan to provide some tables for discussion in the preliminary draft report due December 30th.

| | Q1 2024 | | | Q2 2024 | | | Q3 2025 | | | Q4 2025 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jul | Ago | Set | Out | Nov | Dez | Jan | Fev | Mar | Abr | May | Jun | July |
| **Milestone 1: Secondary data collection and cleaning (Deadline: Set. 30 2024). Survey design for primary data** | | | | | | | | | | | | | |
| Literature review | Jul.15 | | | | | | | | | | | | |
| Data collection | | | | | | | | | | | | | |
| US Agricultural Census | | | | | | | | | | | | | |
| Risk Management Agency (RMA) | | | | | | | | | | | | | |
| Data Cleaning | | | | | | | | | | | | | |
| Data organization and cleaning | | | | | | | | | | | | | |
| Merge Ag Census and RMA data | | | | | | | | | | | | | |
| Survey design and testing | | | | | | | | | | | | | |
| IRB submission | | | | | | | | | | | | | |
| **Milestone 2: Initial analysis (descriptive statistics) and preliminary draft report (Deadline: Dec. 30 2024). Collection Primary data** | | | | | | | | | | | | | |
| Data Analysis | | | | | | | | | | | | | |
| Summary statistics | | | | | | | | | | | | | |
| Tables and graphs | | | | | | | | | | | | | |
| Draft Report write up | | | | | | Dec. 30th | | | | | | | |
| Survey send out | | | | | | | | | | | | | |
| Presentation at conference | | | | | | | | | | | | | |
| **Milestone 3: Econometric estimations and final report (Deadline Mar. 14 2025)** | | | | | | | | | | | | | |
| Econometric Estimations | | | | | | | | | | | | | |
| Primary data | | | | | | | | | | | | | |
| Organization and cleaning | | | | | | | | | | | | | |
| Analysis | | | | | | | | | | | | | |
| Final draft report (with econometric part) | | | | | | | | | Mar.14 | | | | |
| Preliminary Repot with primary data | | | | | | | | | | | | Jun 30th | |
| Presentation to Stakeholders at conferences | | | | | | | | | | | | | |
| **Milestone 4: Finalizing activities - contract end Apr. 14 2025 (extended to July 31st)** | | | | | | | | | | | | | |
| Final draft report (with all data) | | | | | | | | | | | | | Jul 31st |
| working on any final updates to deliverables | | | | | | | | | | | | | Jul 31st |
| Coordination with SDFR Policy Research Center | | | | | | | | | | | | | |
| Monthly progress reports | | | | | | | | | | | | | |

Note: Dates in the grids were provided by SDFR Policy Research Center

Additional Documents

AAEA abstract

## Preliminary Research Report Certification Form

Reporting Period Dates from: February 1, 2025 to February 27, 2025

Principal Investigator(s): Dr. Ana Claudia Sant'Anna

Research Study Title: Documenting and analyzing crop insurance participation in counties with Socially Disadvantaged Farmers and Ranchers (SDFRs)

Institution/Organization: West Virginia University

Address: Office of Sponsored Programs, 886 Chestnut Ridge Road

Telephone: 304 293 3998 Fax Number: 304 293 7435

Email: anaclaudia.santanna@mailwvu.edu

Website: https://www.davis.wvu.edu/faculty-staff/directory/ana-claudia-sant-anna

*Principal Investigator Assurance:*

I certify that the statements in this report are true, complete, and accurate to the best of my knowledge.

Ana Cláudia Sant'Anna 02/25/2025

*Principal Investigator Signature* *Date*

*Institutional/Organizational Assurance:*

I certify that the statements in this report are true, complete, and accurate to the best of my knowledge.

Tracy Vuong 02/25/2025

*Signature of Authorized Official* *Date*

Name/Title: Tracy Vuong, Associate Director, Award Initiation & Management

Address: 886 Chestnut Ridge Road, Morgantown, WV 26506-6845

Telephone: 304 293 3998 Fax Number: 304 293 7435

Email: wvusponsoredprograms@mail.wvu.edu

Website: https://osp.research.wvu.edu/

## Preliminary Financial Statement Form

Reporting Period Dates: February 1, 2025 to February 27, 2025

Principal Investigator(s): Dr. Ana Claudia Sant'Anna

| Budget Categories | Budgeted Amount | Expenditures | Remaining Balance |
|---|---|---|---|
| **Personnel** | | | |
| Salaries Total | $40,992 | $12,313.86 | $28,678.14 |
| Benefit Eligible & Annual Inc | $16,094.00 | 0 | $16,094.00 |
| Grad Assts Fellows Stud Emp | $24,898 | $12,313.86 | $12,584.14 |
| Fringe Benefits Total | $5,943 | $1,108.26 | $4,834.74 |
| FB Grant Fr Reim Grad Std (includes summer) | $2,241.00 | $1,108.26 | $1,132.74 |
| WVU BE (Sant'Anna) | $3,702.00 | 0 | $3,702.00 |
| **Total Personnel** | $46,935 | $13,422.12 | $33,512.88 |
| **Contract Programming/Subawards** | $0 | $0 | $0 |
| **Equipment** | $0 | $0 | $0 |
| **Supplies** (Ge Exp Office Expenses) | $1,965 | $49.07 | $1,915.93 |
| **Travel** | $10,000 | $823.44 | $9,176.56 |
| **Other** | $0 | $0 | $0 |
| **Research and Data Collection** | $0 | $0 | $0 |
| **Commodities** | $0 | $0 | $0 |
| | | | |
| **Total Commodities** | | | |
| **Total Direct Cost Non-Personnel** | $11,965 | $872.51 | $11,092.49 |
| **Total Direct Cost Personnel** | $46,935 | $13,422.12 | $33,512.88 |
| **Total Direct Cost** | $58,900 | $14,294.63 | $44,605.37 |
| **Total Indirect Cost (10%) (F&A Reimb & Aux Srve Chrg)** | $5,890 | $1,429.50 | $4,460.50 |
| **Total Budget Amount** | $64,790 | $15,720.13 | $49,069.87 |

Appendix – Slides prepared for outreach presentations

# Documenting and analyzing crop insurance participation in counties with Socially Disadvantaged Farmers and Ranchers(SDFRs)

**PI: Ana Claudia Sant'Anna**

**Assistant Professor in Agribusiness and Ag Finance**

**Co-PI: Ranjita Bhandari**

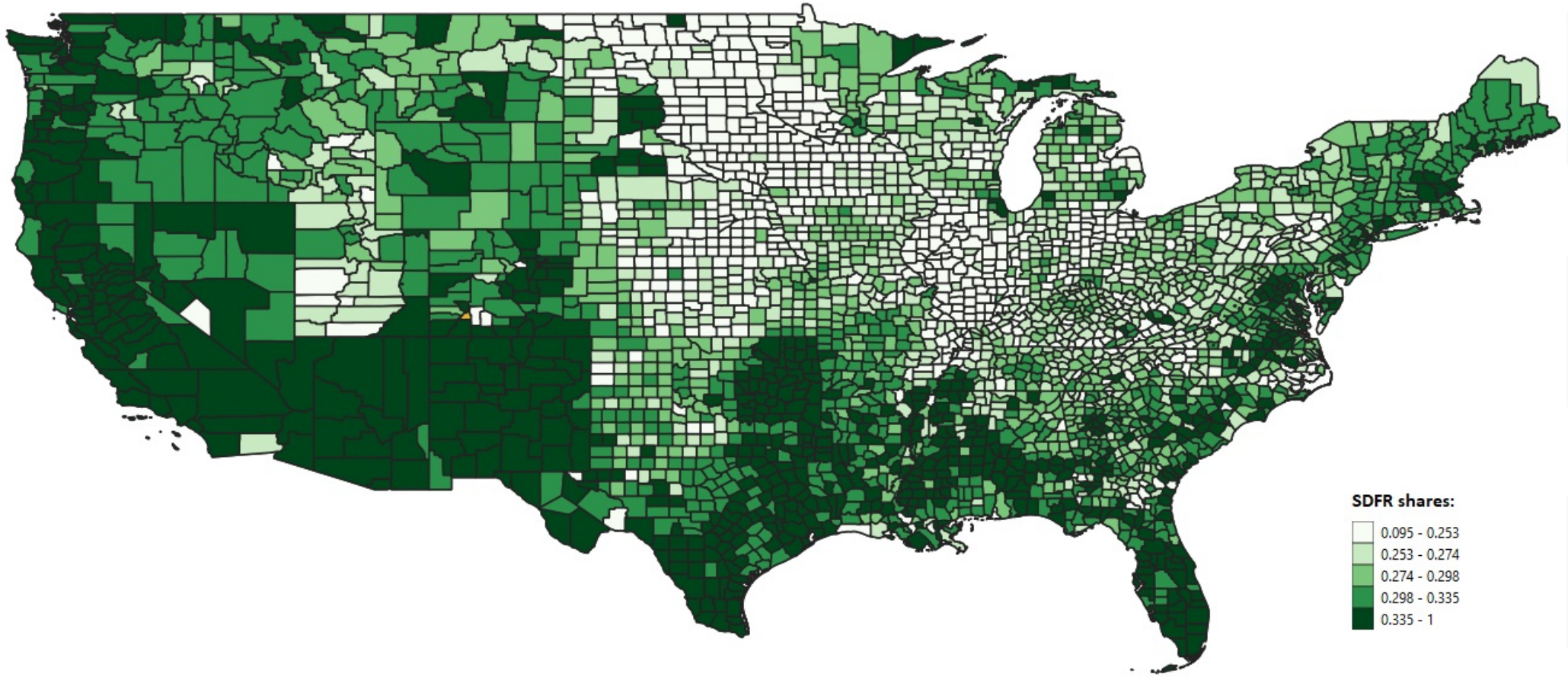
**PhD Candidate in Natural Resource Economics**

WestVirginiaUniversity.

# Socially Disadvantaged Farmers and Ranchers

*SDFR are farmers or ranchers who face discrimination due to their race, ethnicity, or gender (USDA/ERS, 2022).*

# Limited SDFRs in the Central and Corn Belt region



# What does recent research on SDFR tell us?

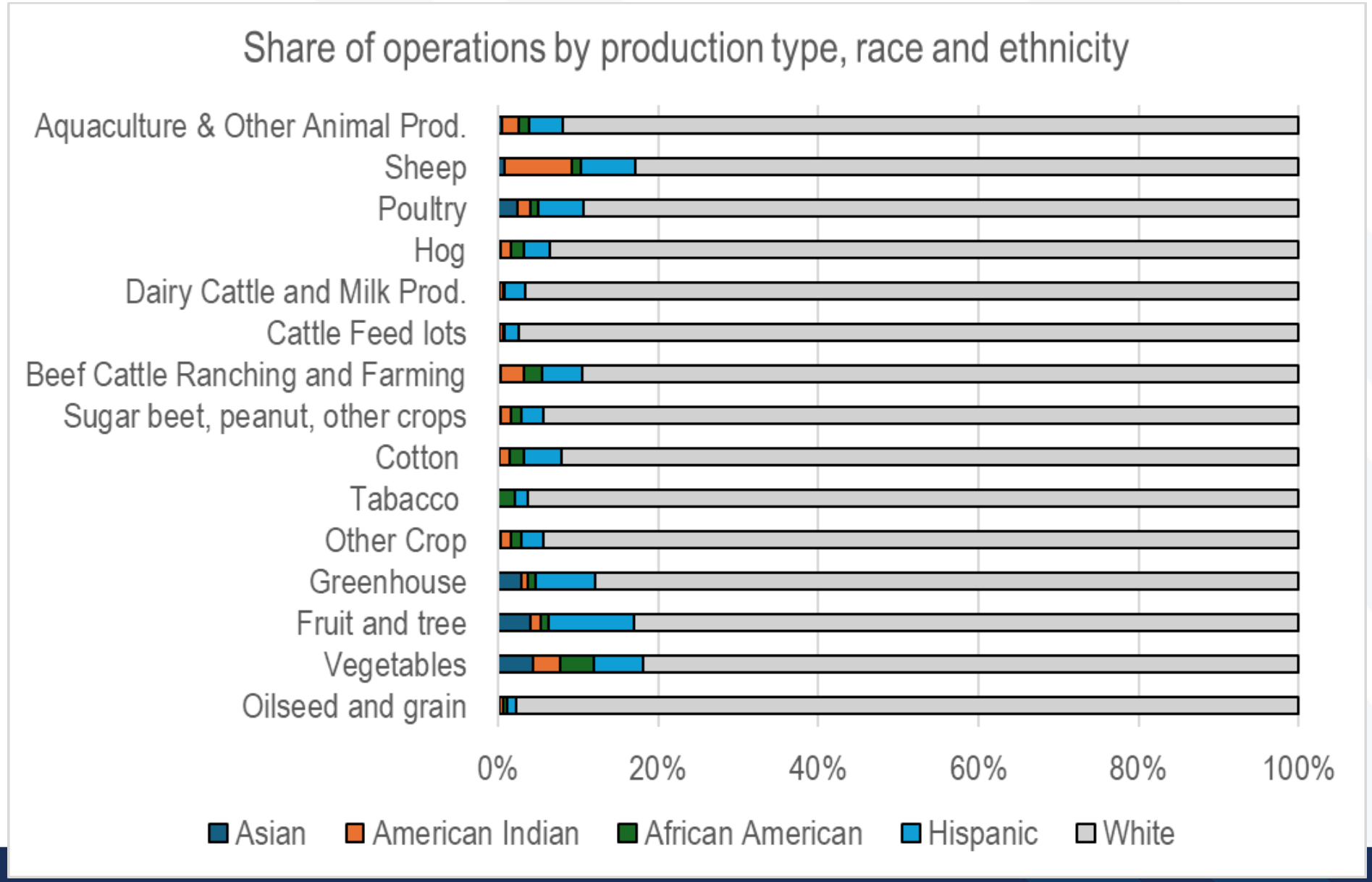
- Teal and Stevens (2023) identify potential "racially discriminatory impacts of the Risk Management Agency's rate-setting methodology"
- Sant'Anna, Kim and Demko (2023) find that for Black owned agribusinesses the business location and county level income had a role in the distribution of the paycheck protection program (PPP)
- Ahrendsen et al. (2022) beginning farmers are more common among SDFRs and in regions with smaller farms. Farm Service Agency is a crucial in increasing access to capital to beginning SDFR.
- Hendricks et al. (2024) find that "farms with a White operator were eligible to receive significantly more (market facilitation program) payments than farms with a non-White operator."
- Sant'Anna and Bhandari (2023) report little diversity in the board of directors and senior management of Farm Credit Institutions, yet the level of diversity is associated with the that of the county it serves.

# Characteristics of Producers by race and ethnicity, 2022

| | Asian | American Indian | African American | Hispanic | White |
|---|---|---|---|---|---|
| Age | 55.4 | 57.3 | 61.7 | 54.9 | 58.2 |
| Acres Operated (1,000 acres) | 2,608 | 55,781 | 4,319 | 36,866 | 823,943 |
| Number Operations | 16,072 | 40,621 | 28,723 | 83,505 | 1,829,449 |
| Number Producers | 22,788 | 56,203 | 41,807 | 112,379 | 3,219,263 |

Source: 2022 Agricultural Census, USDA

- There are more white producers and number of operations than any other SDFR. Hispanic producers have the youngest average age

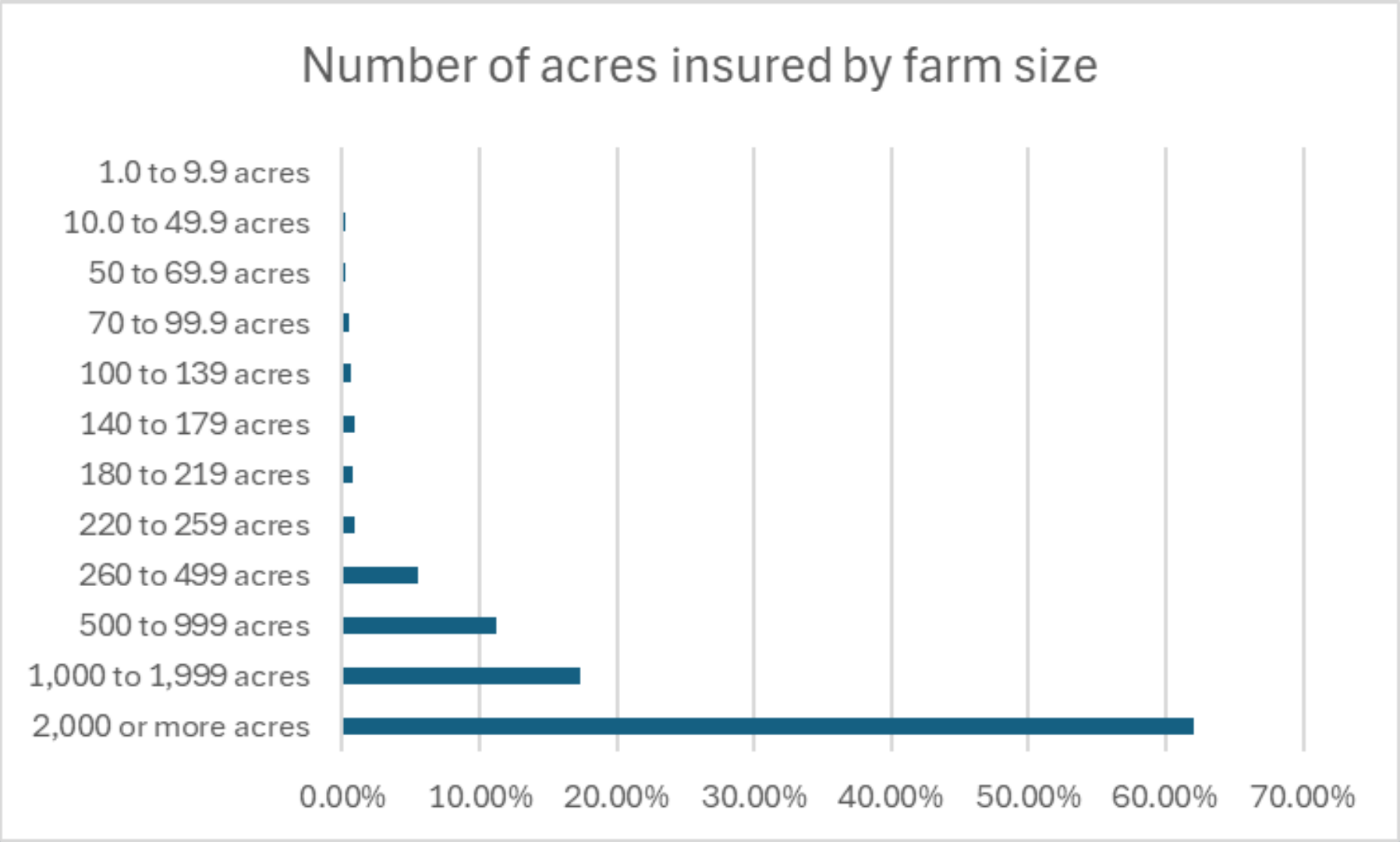



- Hispanic operations are mostly in fruits and animal production
- African American operations are mostly in vegetables, tabacco, cotton, cattle, and hog.



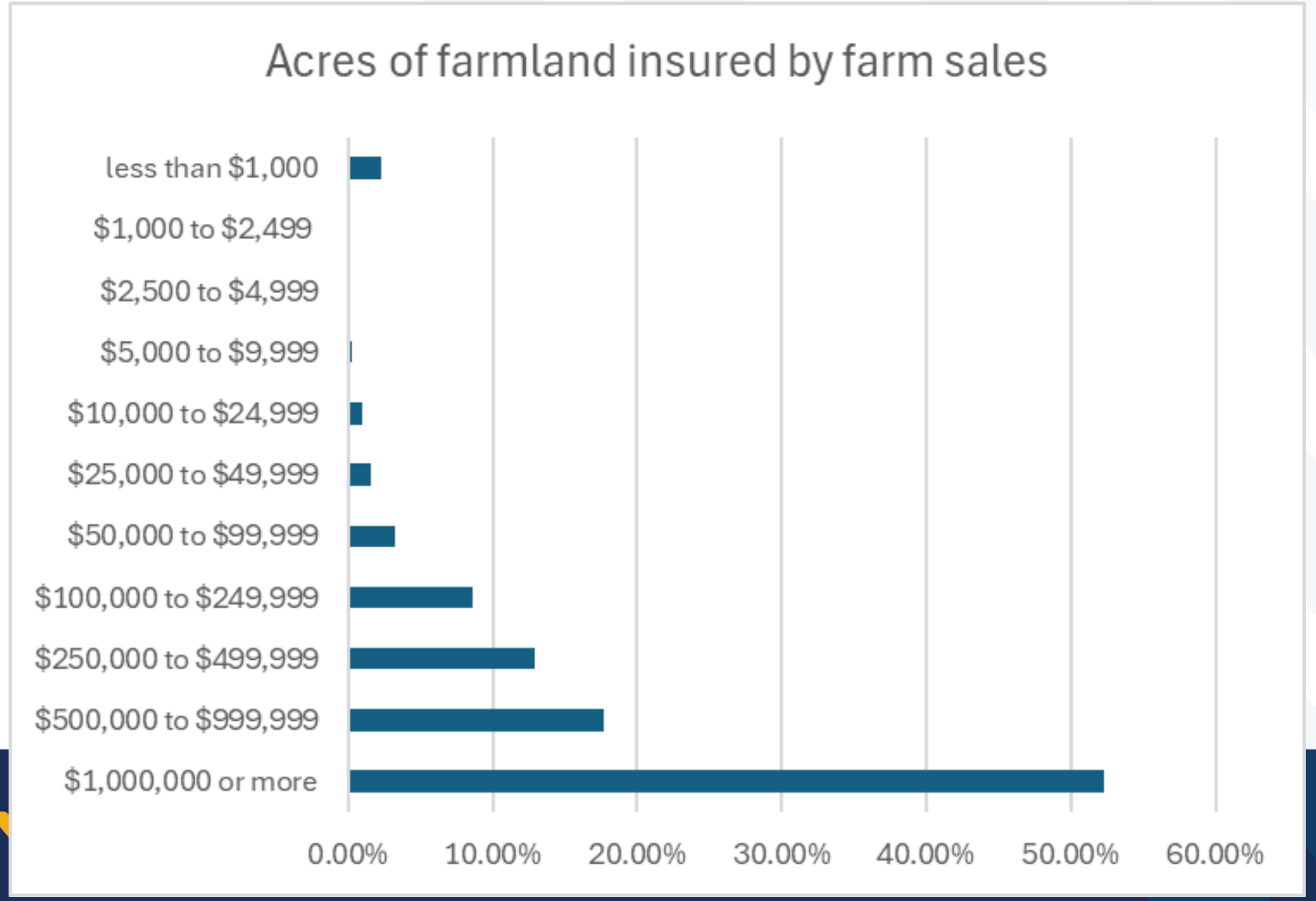
Source: 2022 Agricultural Census, USDA

# Larger farms have more land insured




Source: 2022 Agricultural Census, USDA

# Farms with higher sales have the most land insured




Source: 2022 Agricultural Census, USDA

# What is crop insurance and how to purchase it?

- ***What is crop insurance?*** It is a risk management tool available to farmers to ensure their farming operations against events (e.g. weather conditions and declines in market prices).

- ***What are the steps to purchase crop insurance?***

1. Determine the farm product and risk you need to insure.
2. Match these to the types of crop insurance policies available.
3. Contact a licensed crop insurance agent approved by the federal government. A list is provided by the USDA Risk Management Agency's Agent Locator tool.
4. Work with your agent to purchase the policy. Make sure you understand all terms, costs, and coverage.

# FEDERAL CROP INSURANCE PRODUCTS – AN OVERVIEW

| Yield Protection | Revenue Protection | Livestock Risk Protection & Gross Margin | Actual Production History | Area Risk Protection | Rainfall Index |
|---|---|---|---|---|---|
| Multi-peril policy that insures against yield losses due to natural disaster. Uses the spring price to determine coverage levels. | Multi-peril policy that insures both yield loss and changes between the harvest price and the spring price | Financial protection against price or margin erosion. | Multi-peril policy that insures against yield loss by covering future yields based on past yields. | County-based policy that insures against widespread loss of revenue caused by low prices, low yields or both. | Insurance policy to protect livestock feeders against loss of pasture, rangeland or forage due to drought. Uses NOAA rainfall data. |
| Margin Protection | Enhanced Coverage Options (ECO) | Whole Farm Revenue Protection | Dairy Revenue Protection (DRP) | Dollar Plans | Others |
| Area-based, underlying policy that covers unexpected decreases in operating margins for corn, rice, soybeans and wheat. | Policy that offers additional area-based coverage for a portion of the underlying policy up to 90% or 95%. | Tailored insurance plan to provide coverage for all commodities of a farm under one insurance policy. | Allows dairy producers to purchase protection against declines in milk prices. | Multi-peril policy type that uses cost of establishing a crop (reference maximum dollar amount). Often used for specialty tree crops. | RMA regularly adds new policies and coverage options. Policies can often be combined and catered to specific operations. |



Source: USDA RMA

# Some interesting facts on crop insurance

- In 2022, federal crop insurance offered coverage for $194 billion in agricultural production (USDA 2024). Yet, not all farms purchase insurance.
- In 2022, 9% of farms that grow specialty crops such as fruits, vegetables, and nursery crops purchased federal insurance. In contrast, 62% of farms that grew crops such as cotton, corn, soybeans, wheat, peanuts, rice, and sorghum were covered by Federal Crop Insurance Program.
- According to data collected on livestock risk protection insurance, considering the period of 2003-2025, on average 21 weeks or more prior to the intended marketing date at an average coverage level of 98%.
- RMA data from 2000-2022, shows that Texas is the second largest state in the number of crop insurance policies sold.
- Corn, soybeans and wheat are the crops that had the most policies sold between 2000-2022.

# Crop Insurance Policies Sold in USA (2015-2024)

**National Total (All Farmers, All Counties)**

- **Min:** 2,158,966
- **Max:** 2,366,826

**Counties with < 30% SDFRs**

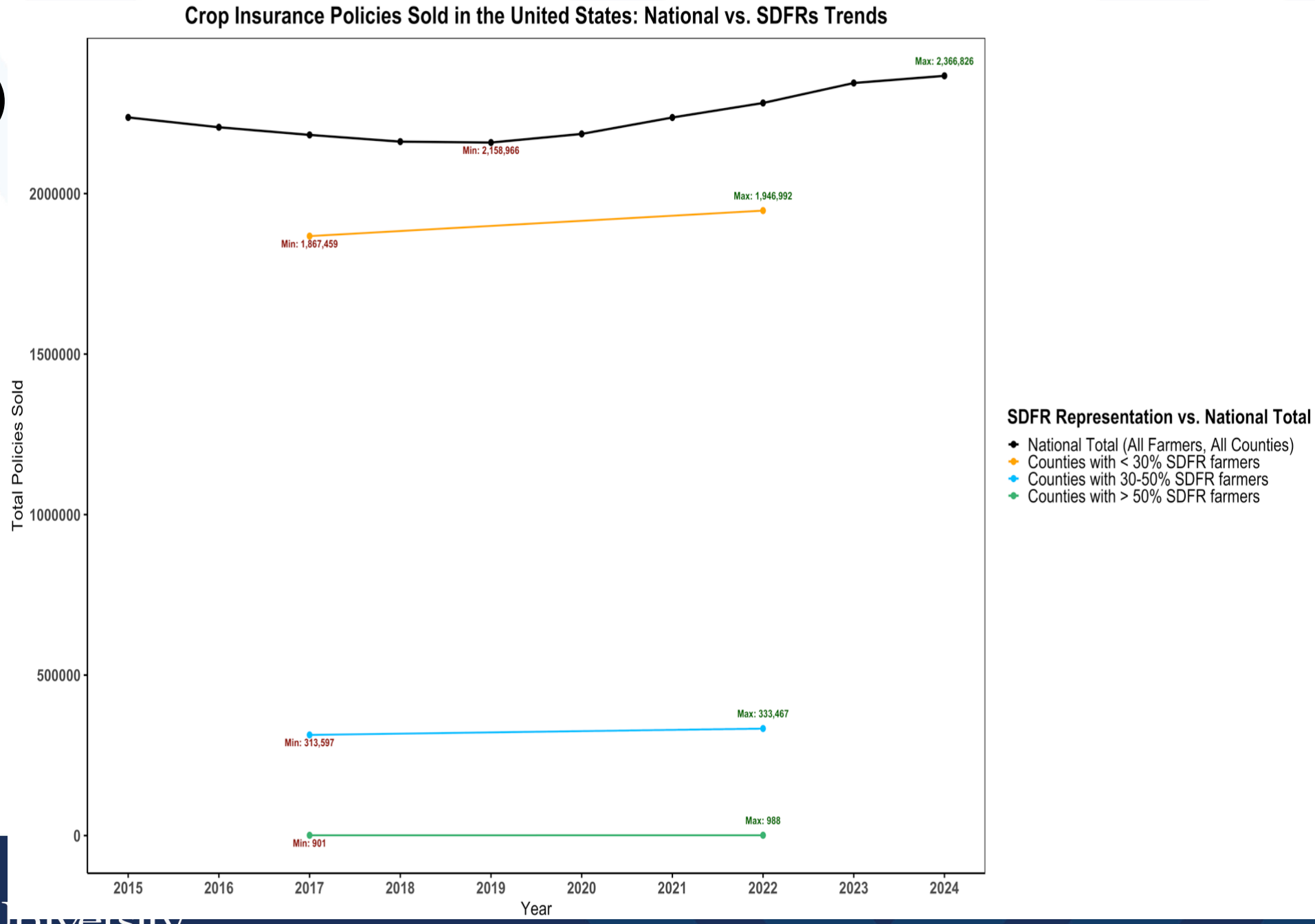
- **Min:** 1,867,459
- **Max:** 1,946,992

**Counties with 30-50% SDFRs**

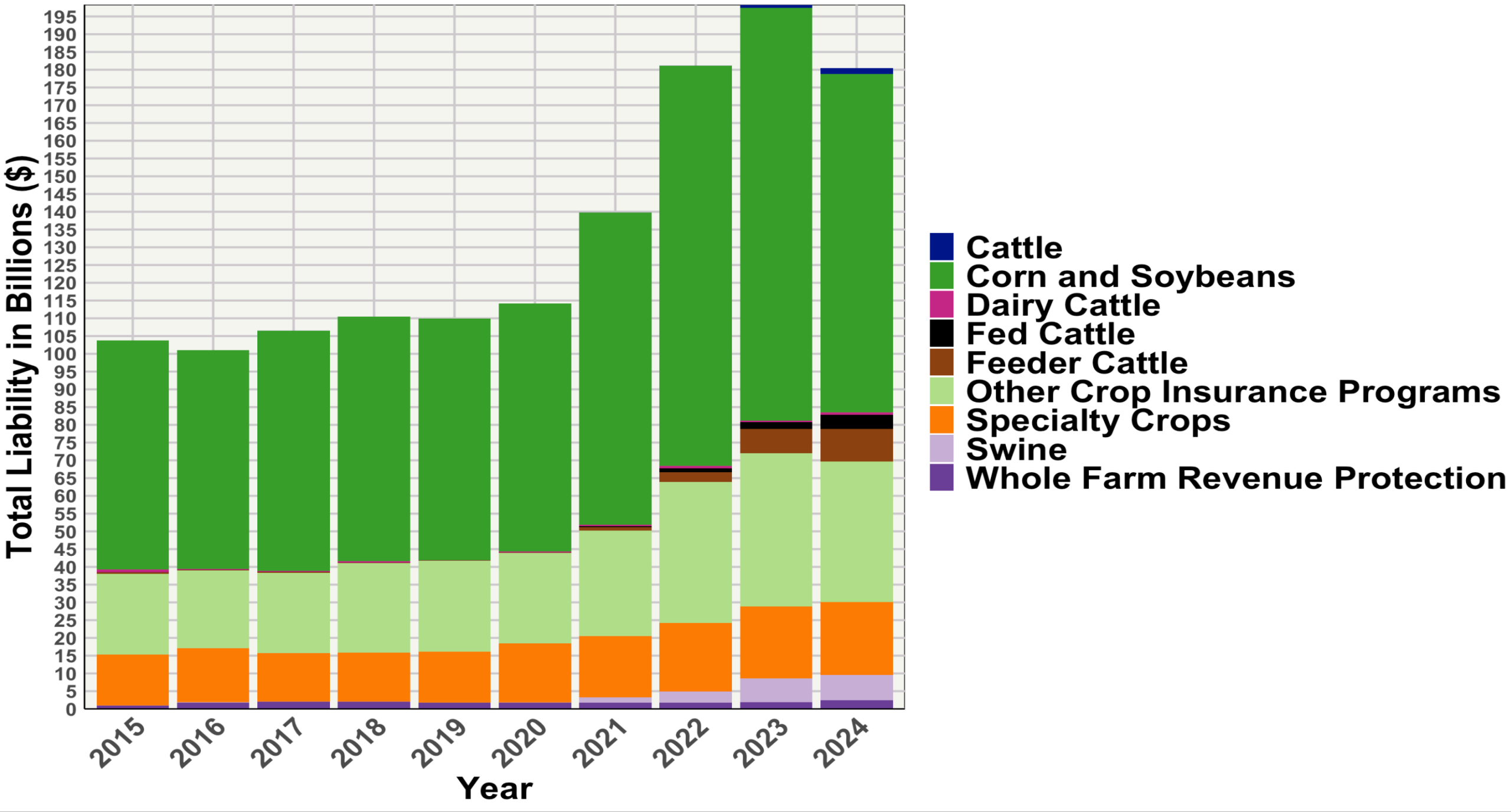
- **Min:** 313,597
- **Max:** 333,467

**Counties with > 50% SDFRs**

- **Min:** 901
- **Max:** 988



# Total Liability of Crop Insurance and Livestock Programs



# How can you be a part of change?

- Help us understand why farmers are not purchasing crop insurance by filling out a **15-minute survey.**
- Our goal is to understand what factors are hindering insurance purchase to, potentially, bring about changes to the Federal Crop Insurance Program in the next Farm Bill.
- Participation in the survey is voluntary.
- Contact info: rb00056@mix.wvu.edu or anaclaudia.santanna@mail.wvu.edu

# What is this study about?

- This study aims at documenting insurance purchase among farmers, especially socially disadvantaged farmers and ranchers, and identifying which factors may be hindering farmer's decision to purchase it.


- Your input will help us shape policies for the next Farm Bill and develop programs to make crop insurance more accessible to farmers.
- Aligned with the Socially Disadvantaged Farmers and Ranchers Policy Research Center's mission, this study provides key data and insights on policy effectiveness in promoting equitable crop insurance access.

Alcorn

SOCIALLY DISADVANTAGED FARMERS
AND RANCHERS POLICY RESEARCH CENTER

# Human Subjects Usage Form

Reporting Period Dates from 02/01/2025 to 02/27/2025

Principal Investigator(s): Ana Claudia Sant'Anna

**Human Subjects:**

If applicable, attach an updated IRB approval that extends into

the research study end date. Check one:

- ☐ No human Subjects
- ☒ Exempt (IRB is attached with December Report)
- ☐ Yes, award involves human subjects. (Enclose copies of all key personnel research training certificates for dealing with human subjects.)

Indicate the total projected and the actual enrollment of human subjects by ethnicity and race.

| **Ethnicity** | **Projected Females Number** | **Actual Females Number** | **Projected Males Number** | **Actual Males Number** | **Total** |
|---|---|---|---|---|---|
| Hispanic or Latino | 10 | 3 | 10 | 8 | 11 |
| Not Hispanic or Latino | 100 | 35 | 100 | 82 | 120 |
| Unknown or Not Reported | | | | | |
| **Racial Categories** | **Projected Females Number** | **Actual Females Number** | **Projected Males Number** | **Actual Males Number** | **Total** |
| Native American/Indian/ Alaska Native | 0 | 1 | 0 | | 1 |
| Asian | 0 | 6 | 0 | 1 | 7 |
| Native Hawaiian or Pacific Islander | 0 | | 0 | | |
| Black or African American | 50 | 10 | 50 | 12 | 22 |
| White | 50 | 19 | 100 | 53 | 72 |
| More than one Race | 10 | 3 | 10 | 9 | 12 |
| Unknown or Not Reported | 10 | 3 | 50 | 5 | 11 |

Alcorn

SOCIALLY DISADVANTAGED FARMERS
AND RANCHERS POLICY RESEARCH CENTER

# Equipment Inventory List

**Only equipment noted in the research study proposal and budget may be purchased with award funds. Equipment not approved in the award proposal budget may only be purchased after prior approval has been obtained in writing from the Policy Research Analyst for the Socially Disadvantaged Farmers and Ranchers Policy Research Center. Any equipment purchased with award funds must be documented on the Equipment Inventory List Form and submitted to the Policy Research Analyst.**

## Section A: Research Study Details:

Research Study Period Dates from February 1, 2025 to February 27, 2025

Principal Investigator: Ana Claudia Sant'Anna

Research Study Title: Documenting and analyzing crop insurance participation in counties SDFRs

Principal Investigator: Ana Claudia Sant'Anna

Principal Investigator Email: anaclaudia.santanna@mail.wvu.edu

Principal Investigator Phone Number: 304-293-8757

## Section B: To Be Completed by Principal Investigator

***List all equipment purchased with award funds.***

| Equipment Serial Number | Location | Description and Remarks |
|---|---|---|
| Nothing to report. No physical equipment was listed in the grant | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

***ENDORSEMENT: WE UNDERTAKE THAT THE INFORMATION PROVIDED BY US IS TO THE BEST OF OUR KNOWLEDGE CORRECT AND FREE FROM ERRORS.***

**PRINCIPAL INVESTIGATOR:**

Ana Claudia Sant'Anna

**NAME**

Ana Cláudia Sant'Anna 02/27/2025

**SIGNATURE** **DATE**

**AUTHORIZED OFFICIAL:**

Tracy Vuong, Associate Director, Award Initiation & Management

**NAME**

Tracy Vuong 02/25/2025

**SIGNATURE** **DATE**

N/A

**COMMENTS:**