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SOUTHEASTERN ASSOCIATION FOR COMMUNITY COLLEGE RESEARCH

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STRENGTHENING INSTITUTIONAL IMPACT

ROOTED IN DATA:

AN INTROSPECTIVE LOOK THROUGH A 40-YEAR LENS AT AGRICULTURE STUDENT SUCCESS

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- M.S. | Agriscience Education | Auburn University
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  Research Fellow (2023 - 2025)
- Owner and Founder of Dirt to Diva Productions, LLC. & Dirt to Diva Publishing, LLC. (2013 - Present)
  - 2023 - 2024 Alabama Best Practices Work-based Learning Business
- ACM | CMA | Grammy Recording Member
- Known as “America’s Singing Cowgirl”
- Miss Rodeo USA 2022 | Personality | Horsemanship Winner
- Multi Award-Winning Country Music Entertainer, Songwriter, and Equestrian. (Jessie Lynn®)
- Coach, Mentor, Brand Influencer, and Entrepreneur.
- Auburn University Ag Alumni Peer Mentor
- Recording Academy “Grammy” Peer Mentor











Career Pathways of Agriculture Students:

An Introspective Look Through a 40-Year Lens



History

Over the past 40 years, shifts in technology, education, workforce demands, conservation practices, cultural viewpoints, standardized practices, and industry needs have brought forth new challenges that emphasize the need for additional workforce development programs, majors, specialty degree options, and career paths within the industry. New programs, majors, and career and on-the-job training opportunities are rising.

Importance

Agriculture sustains the world in which we live. Ranging from the food we consume to the clothes we wear, the beauty products we utilize, and the fuel we put into our cars, agriculture is uniquely present in our everyday lives. The next generation of farmers, cattlemen, communicators, educators, researchers, and county extension agents will need to be prepared with a new set of knowledge and have access to different types of hands-on learning experiences.

Key Problems

This session highlights how decades of agriculture student data uncover both **opportunities** and **challenges** in institutional research (IR), strategic planning, and policy decisions. A central focus is the impact of inconsistent or inaccurate data reporting and how even ***small errors*** can cascade into legislative misalignment, policy gaps, or missed funding matches. With discussions on the horizon around performance-based funding, ensuring correct and consistent data practices becomes not just an administrative task, but a **critical factor** in securing resources, shaping policy, and supporting student success.

Institutional Data Reporting Practices	Evolving Career Pathways	Legislation	Workforce Focus	Program Inventory Discrepancies
Stigmas	Artificial Intelligence	Workforce Demands	Economic Stability	Student Retention
Salary	Workforce Retention	Student Attraction	Funding	Continued Research

Conceptual Framework

“Throughout history, vocational education has given students hands-on experience to prepare them for employment. Some might say it all began in 626 BC with the Neo-Babylonian Empire and its knack for apprenticeship-run education. Regardless of its true origin, today’s vocational education is a well-developed schooling system which balances class time and work experience” (Brush, K. 2016, para.1).

Perkins Collaborative Resource Network	Strong Start, Strong Finish	Implications from the History of Vocational Ed.	CTE: 5 Ways That Pay	Principles for Vocational Education
The Problem of Vocational Education	The Quadrumvirate of Vocational Ed.	John Dewey’s Theory of Occupation	Democracy and Education	History and Evolution of Vocational and CTE
Vocational-Technical Education: Reforms and Debates	Investing in America’s Future	Alliance for Excellent Education	AL. Workforce Transformation Act	AL Workforce Pathways Act

Research Questions

1. What career pathways are readily available to agriculture students and how have they changed over the last 40 years?

2. What changes have occurred to warrant the demand for creation of new programs and the expansion of existing programs?

3. How do degrees obtained in agriculture, and related fields, impact the labor force? Specifically, Alabama's labor force?

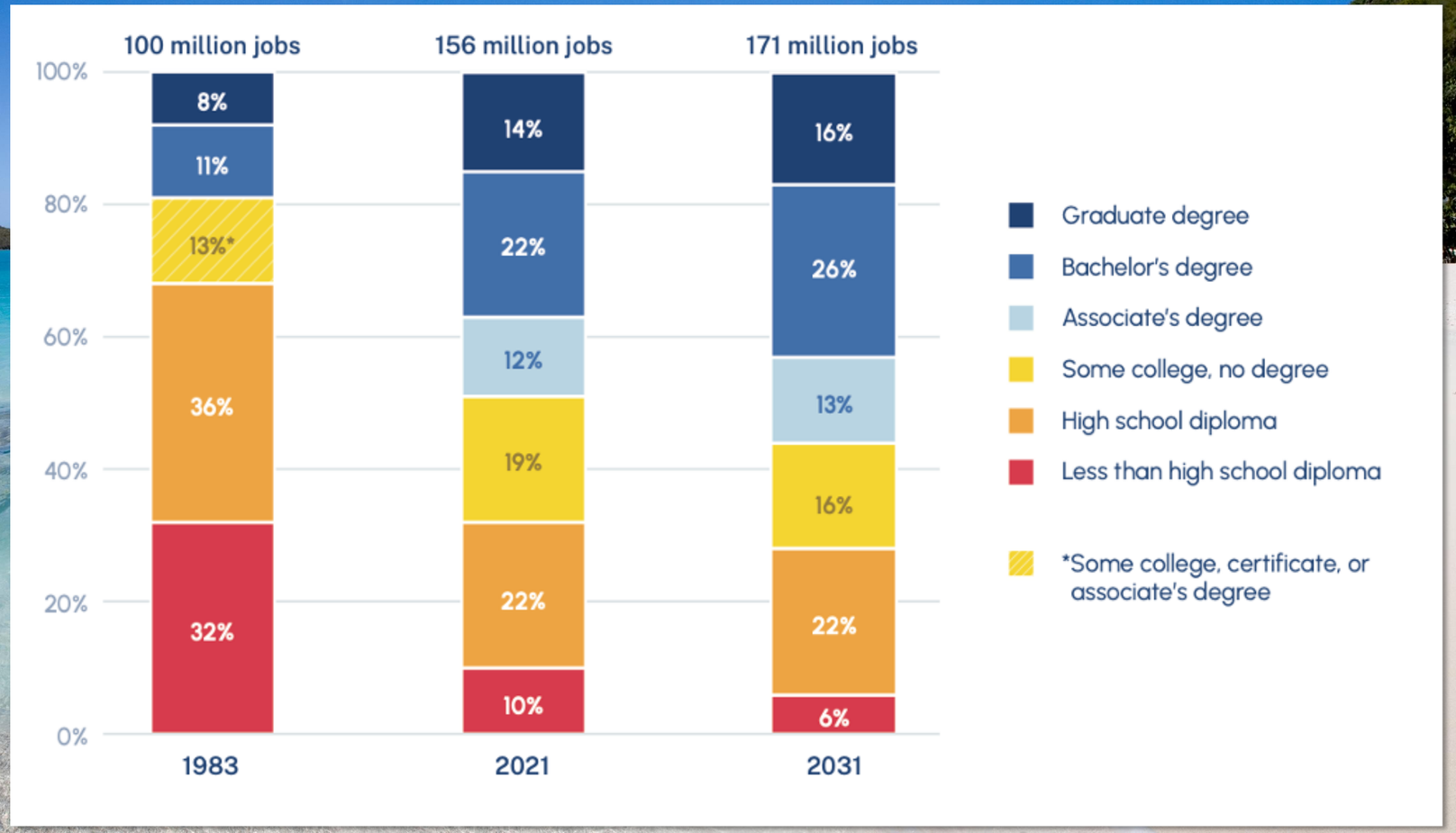
4. How have inaccuracies in institutional data reporting historically influenced policy decisions, legislative priorities, or funding allocations within higher education?

5. In what ways do data reporting errors affect the development and implementation of performance-based funding models, and what implications does this have for student success and workforce alignment?

6. What relationships exist between inconsistent data practices and the misalignment of academic programs with state or federal policy goals?

What's the BIG Deal?

By 2031, an estimated 72 percent of jobs in the U.S. will require a post-secondary degree and/or training.
(Georgetown University. 2024)

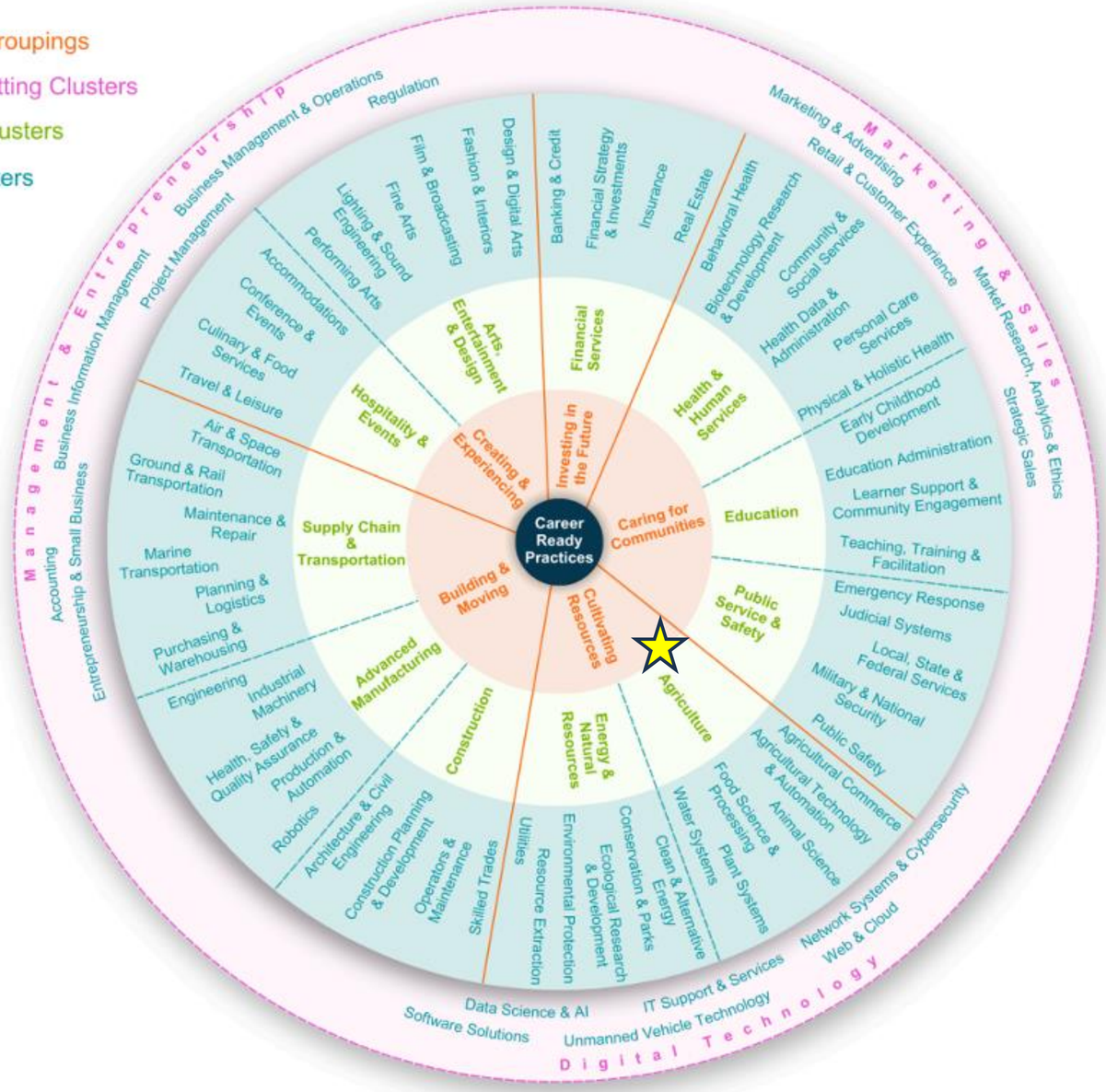


Source: Georgetown University Center on Education and the Workforce forecast using data from the US Census Bureau and Bureau of Labor Statistics, Current Population Survey (CPS); US Census Bureau, American Community Survey (ACS); US Bureau of Labor Statistics; IHS Markit; Lightcast; and US Census Bureau and Bureau of Labor Statistics, Current Population Survey (CPS), 1983.

Career Cluster Model - Wheel View

Key:

- Cluster Groupings
- Cross-Cutting Clusters
- Career Clusters
- Sub-Clusters



What's In a Name

The agriculture industry is comprised of more than one career cluster. employment opportunities for an individual with an agriculture related degree has the potential to be employed in any one of Alabama's 16 recognized career clusters with varying degrees of overlap in between.



Analysis of Data

Limitations

- During the data retrieval process, discrepancies were found in how CIP codes were reported from institutions. This made tracking the individuals beginning to end point harder to identify.
- Number of labor force records. Over 407,382 records were utilized to draw conclusions and show patterned trends within Alabama's workforce.
- Discrepancies brought forth during testing due to incorrect CIP codes and/or NAICS codes.
- No direct in-depth study has been completed previously.

Delimitations

The boundaries of this paper are confined to the State of Alabama, its program implementation strategies, and its labor force. National and additional states data were utilized to show comparisons in program implementation, program vitality, labor force wage appropriations, and program inventory to that of Alabama's. It is important to note that statements regarding trends, statistical significance of results, conclusions, and recommendations have no theoretical application outside of this scope.

Digging Deeper

Population

The study analyzed Alabama's labor force participants over five years, specifically from 2016 to 2022.* Three overlapping data sets were created to assess the interplay between the economy and agriculture education.

Graduates and Program Completers

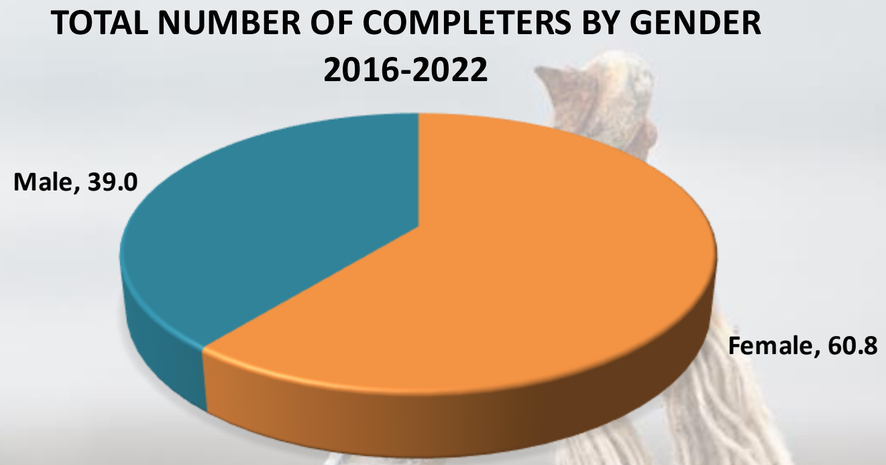
Total of 407,382

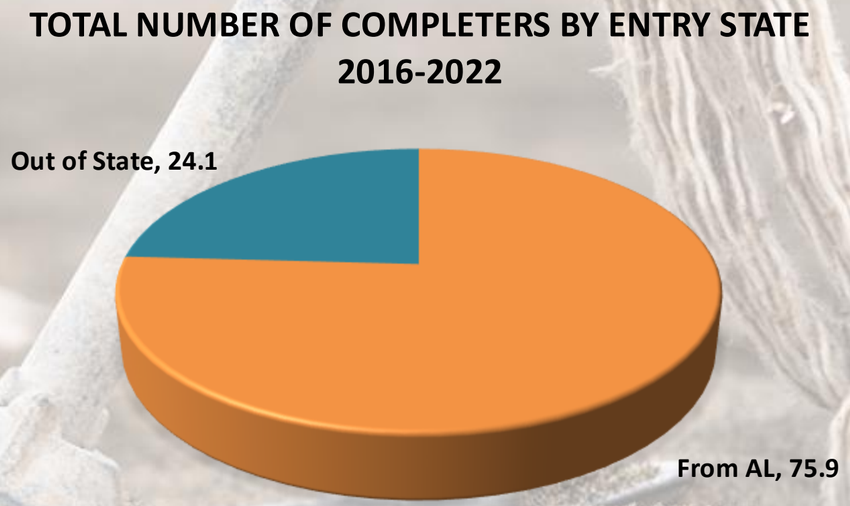
Ag. CIP Graduates & Completers

Total of 2,941

Individuals Working in Agriculture

Total of 3,789



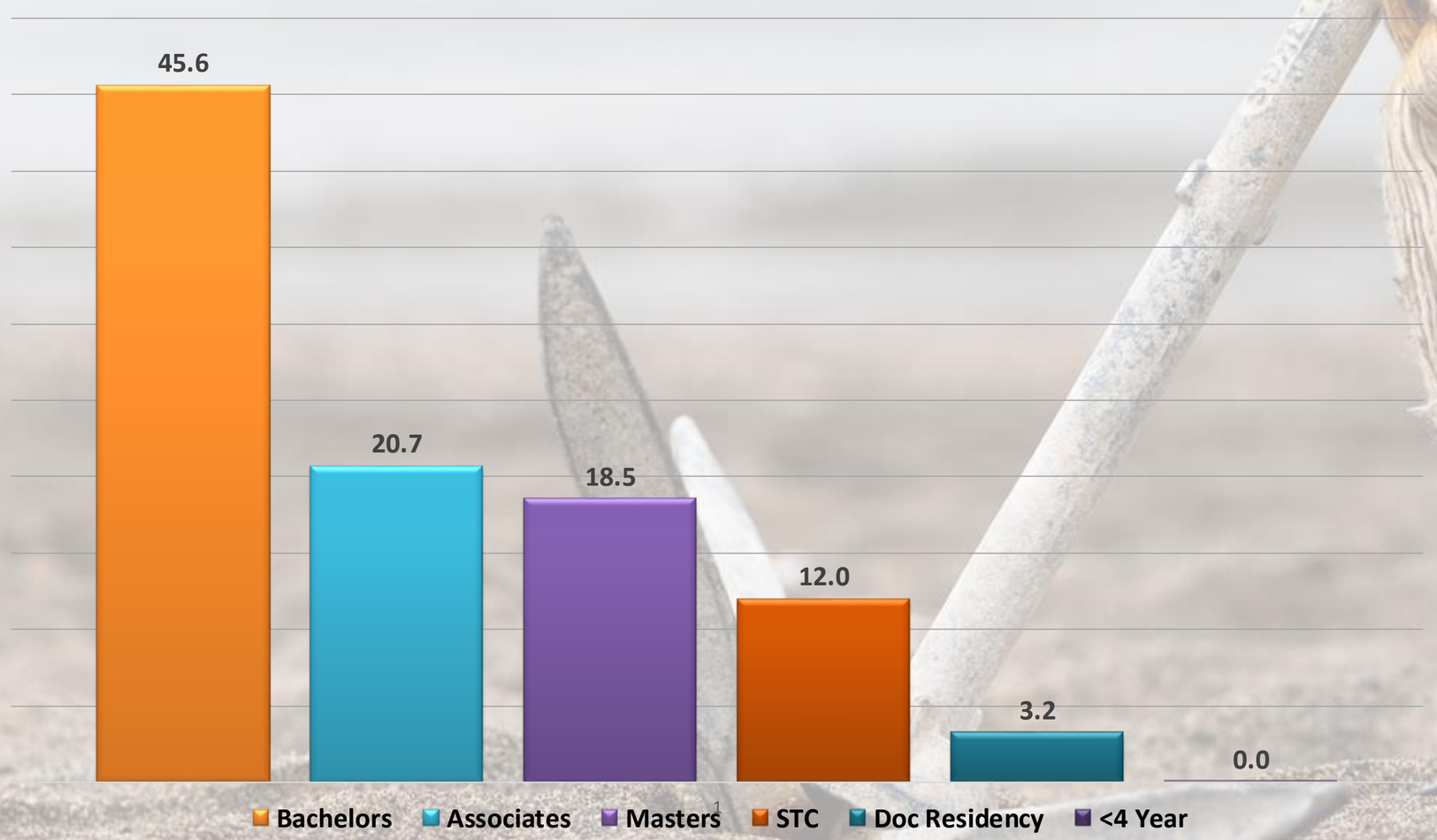


* The year 2019 was omitted from the analysis due to various anomalies and outliers that were present.

Digging Deeper

Graduates and Program Completers

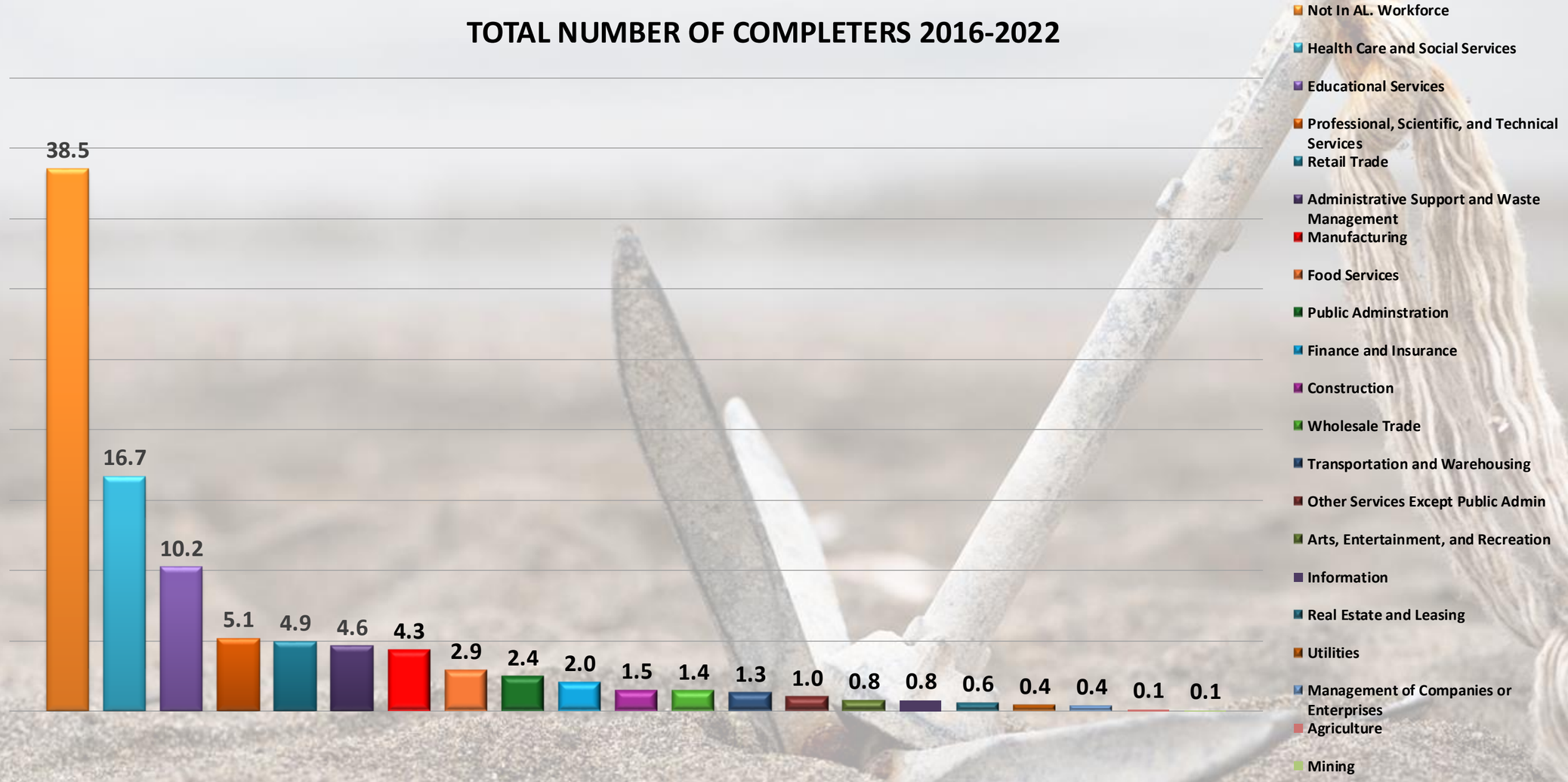
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Digging Deeper

Graduates and Program Completers

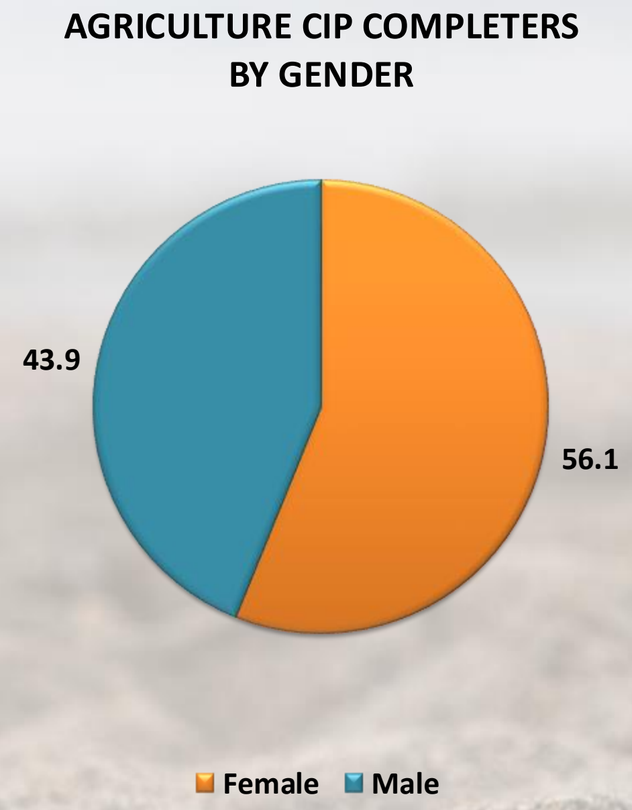
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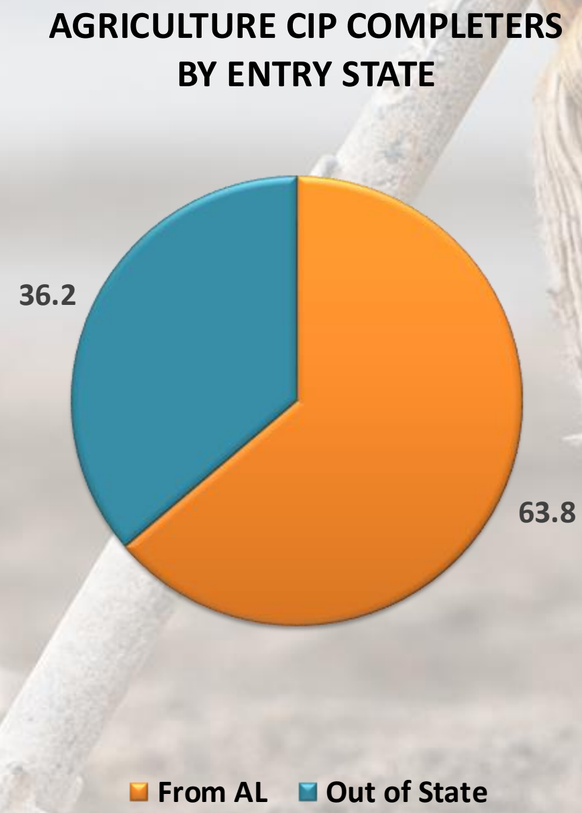


Digging Deeper

Ag. CIP Graduates and Completers

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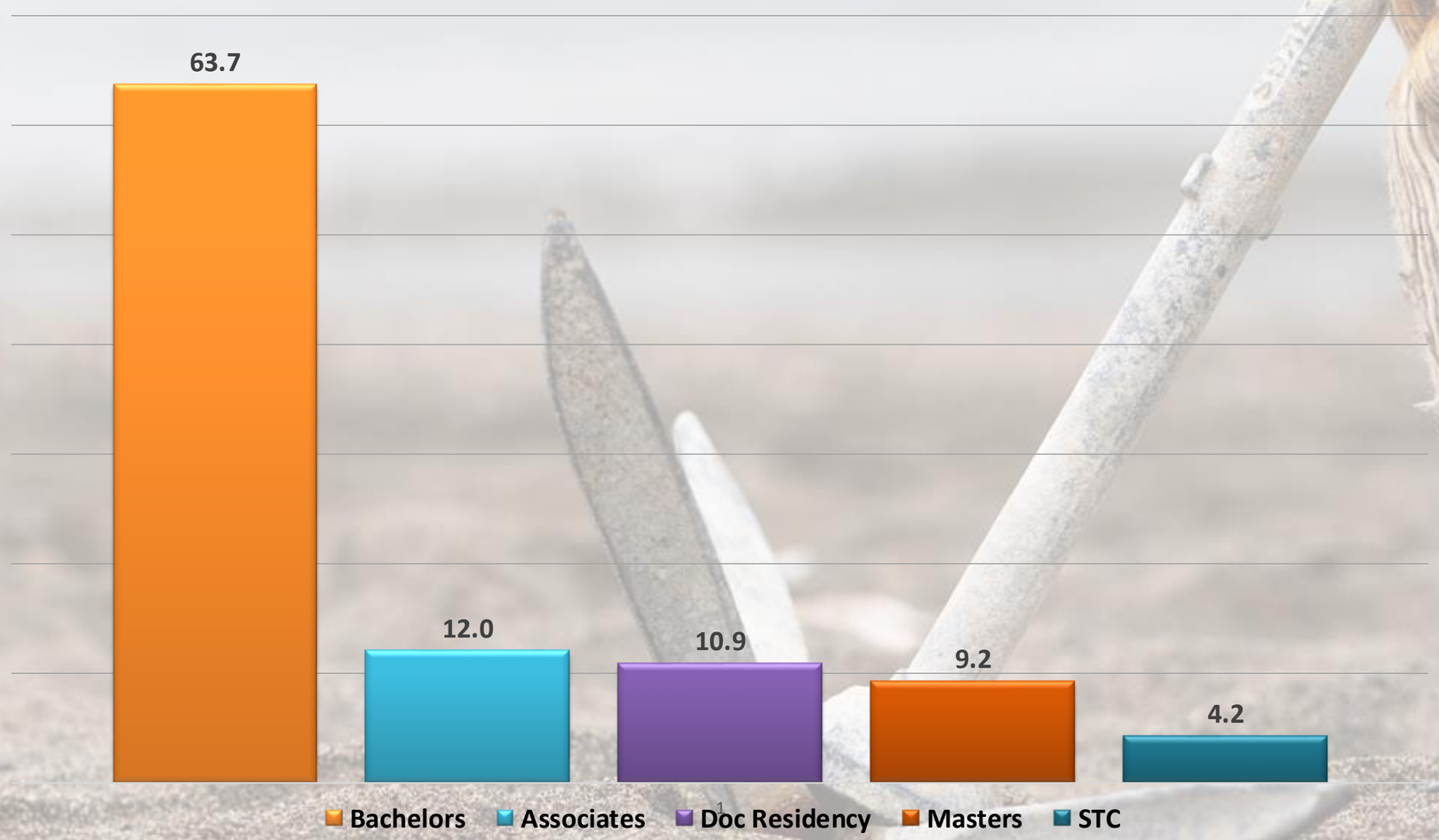




Digging Deeper

Ag. CIP Workforce Participants

Total of 1,281

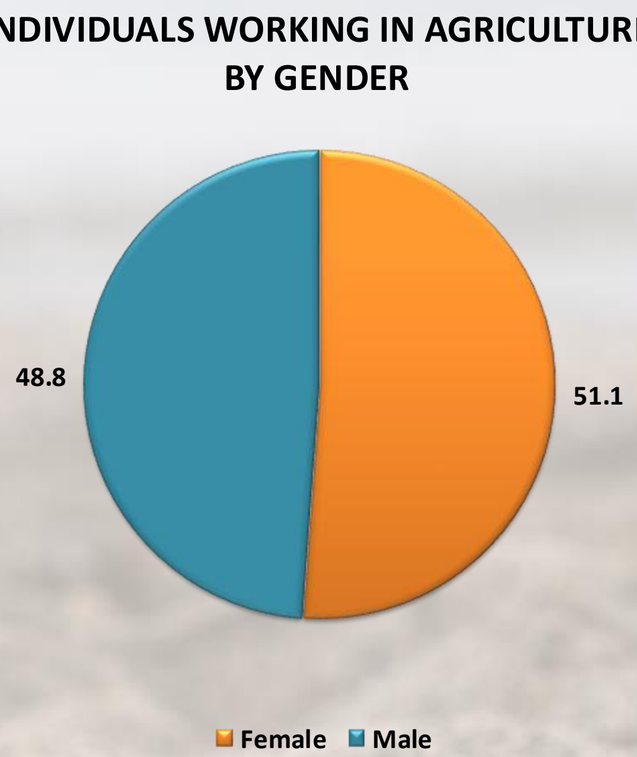


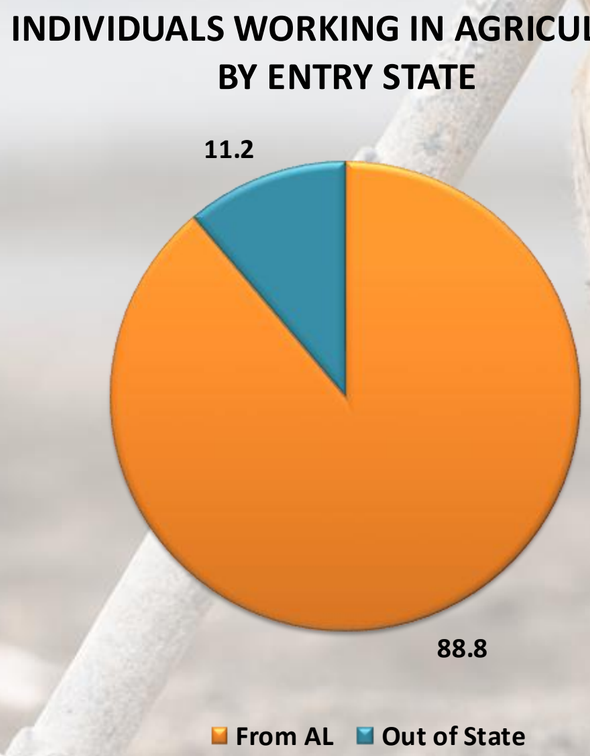
Note: 1,660 completers were not found in Alabama's Workforce.

Digging Deeper

Individuals Working in Agriculture

Total of 3,789



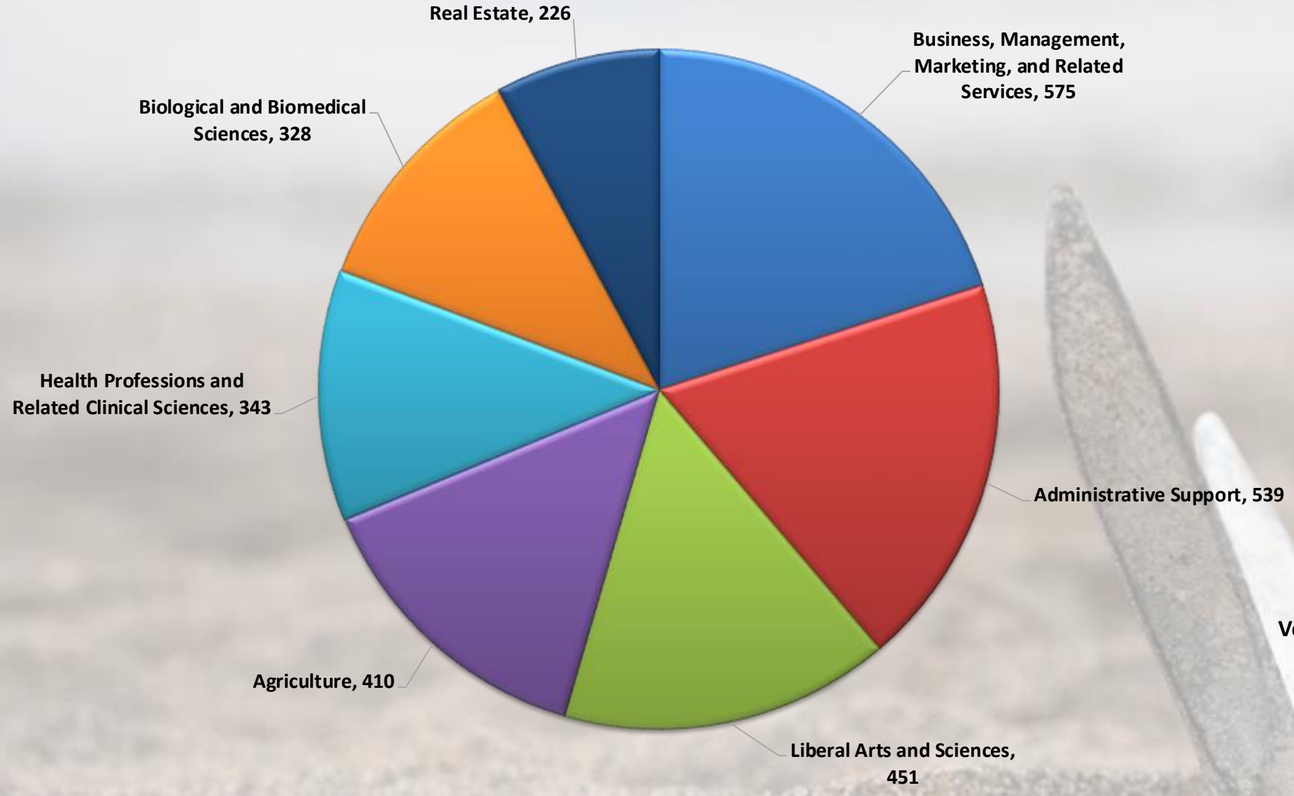


Note: These figures represent individuals identified as working in the agriculture industry and related sectors based on NAICS classifications. This includes both Agriculture CIP completers and other workers in the field.

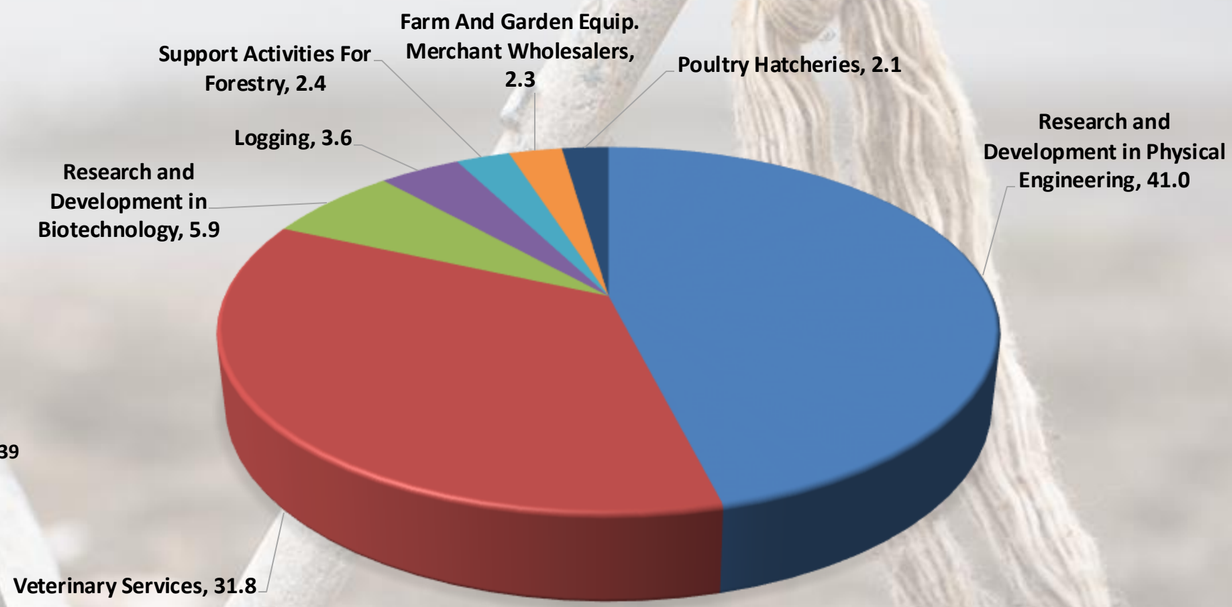
Digging Deeper

What career pathways are readily available to agriculture students and how have they changed over the last 40 years?

TOP DEGREES OBTAINED BY WORKFORCE PARCIPANTS 2016-2022



TOP AREAS ON EMPLOYMENT - AGRICULTURE NAICS WORKFORCE PARTICIPANTS



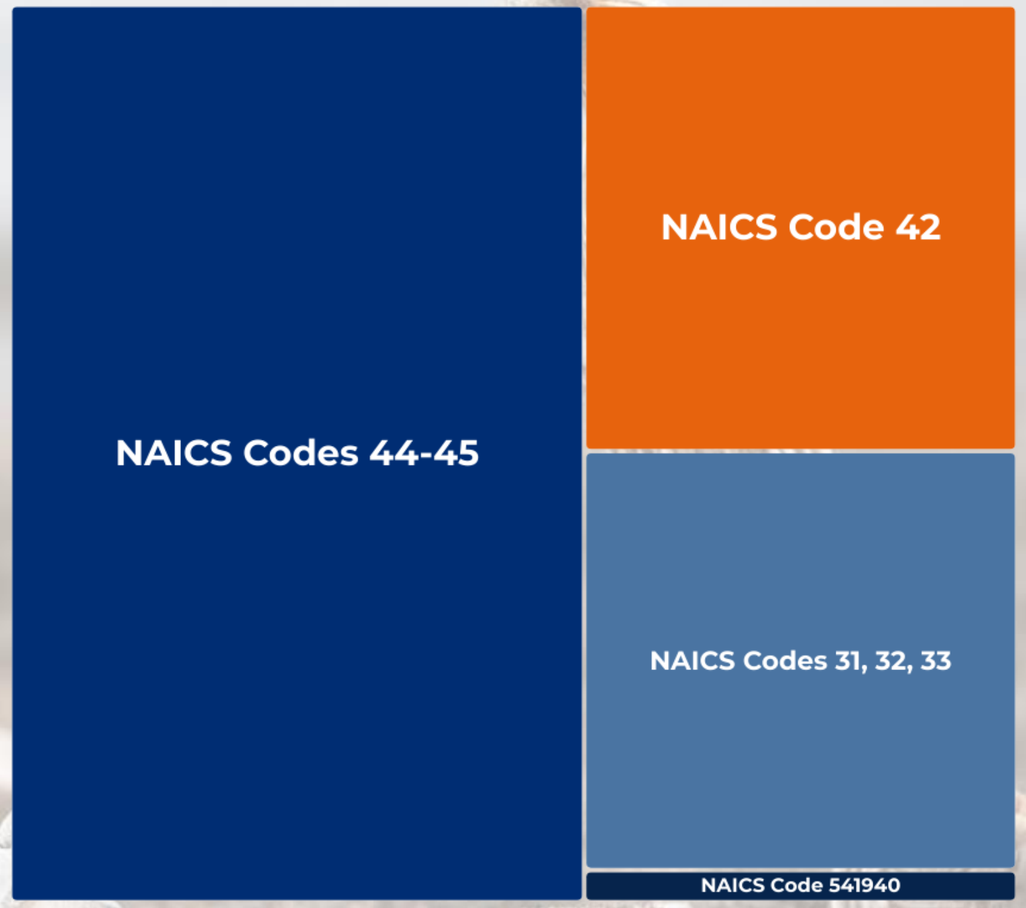
Total of 3,789 Workforce Participants

Digging Deeper

What career pathways are readily available to agriculture students and how have they changed over the last 40 years?

The NAICS online national database for Agriculture, Forestry, Fishing, and Hunting report that there are currently 372,015 active businesses across the United States who report having employed individuals within the industry. NAICS codes 111110 through 115310 are included and are comprised of 19 subcategories under this designation. Additional NAICS codes to be considered include 31, 32, 33, 42, 44, 45, and 541940. According to ACHE's program inventory, and for the purposes of this study, there are 47 specific CIP codes related directly to the agriculture field.

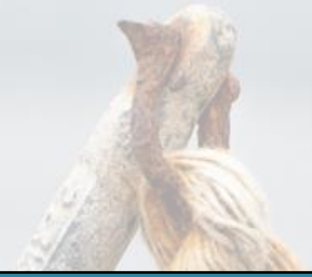
*Some industry examples of these NAICS codes include grain and oil seed milling; sugar and confectionery manufacturing; fruit and vegetable preservation; dairy, meat, and other food manufacturing; lumber, leather, wood product, paper, and petroleum manufacturing; fertilizer, farm machinery, lawn and garden equipment, and commercial service industry machinery manufacturing; farm machinery, industrial, service, grocery, farm product, and petroleum wholesalers and retailers; as well as livestock veterinary services, clinics, animal hospitals, and testing services.



Total of 3,789 Workforce Participants

Digging Deeper

What career pathways are readily available to agriculture students and how have they changed over the last 40 years?



CIP Code Identifiers for the State of Alabama

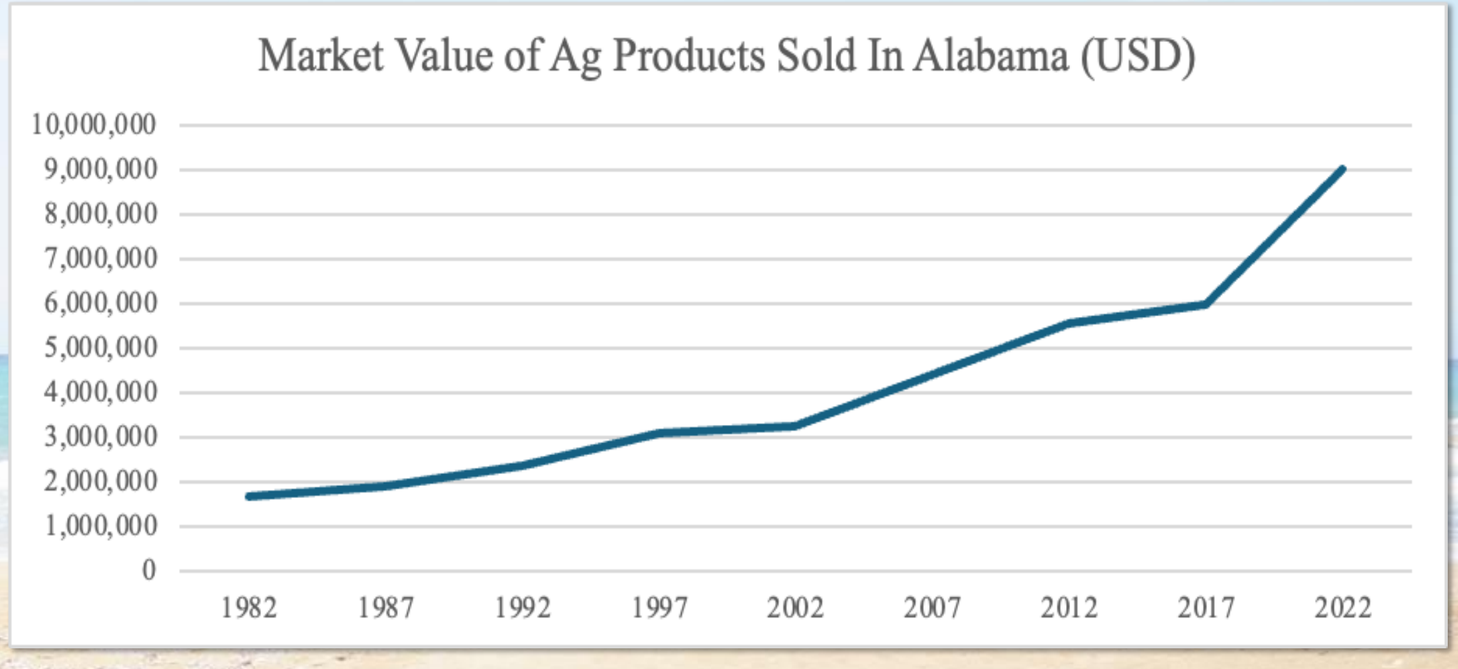
Agri-Business	Agricultural Business and Economics	Agriculture Communications	Agriculture Economics	Agriculture Production
Agriculture Science	Agricultural Foundations	Animal Bio-Health Sciences	Animal Sciences	Animal, Poultry, and Food Science
Biological and Agricultural Technology Management	Biosystems Engineering	Career and Technical Education	Agricultural Teacher Education	Commercial Food Service
Crop, Soil, and Environmental Sciences	Fisheries, Aquaculture, and Aquatic Sciences	Food Science	Forestry and Wildlife Sciences	Landscape Design + More

Digging Deeper

What changes have occurred to warrant the demand for creation of new programs and the expansion of existing programs?

In Alabama, the need for agriculture degree holders and skilled workers has grown due to the changing nature of the workplace. The increased skill of the workforce has yielded an increase in gross domestic product output and market value of products sold within the state. Over the years, many educational programs have seen changes, expansions, and consolidations based on industry demands and labor requirements. ***For example, the expansion of the agricultural teacher education programs from 1985 to the early/mid 2000's.***

1982 – 2022 U.S. Census of Agriculture Market Value of Agriculture Products Sold in Alabama



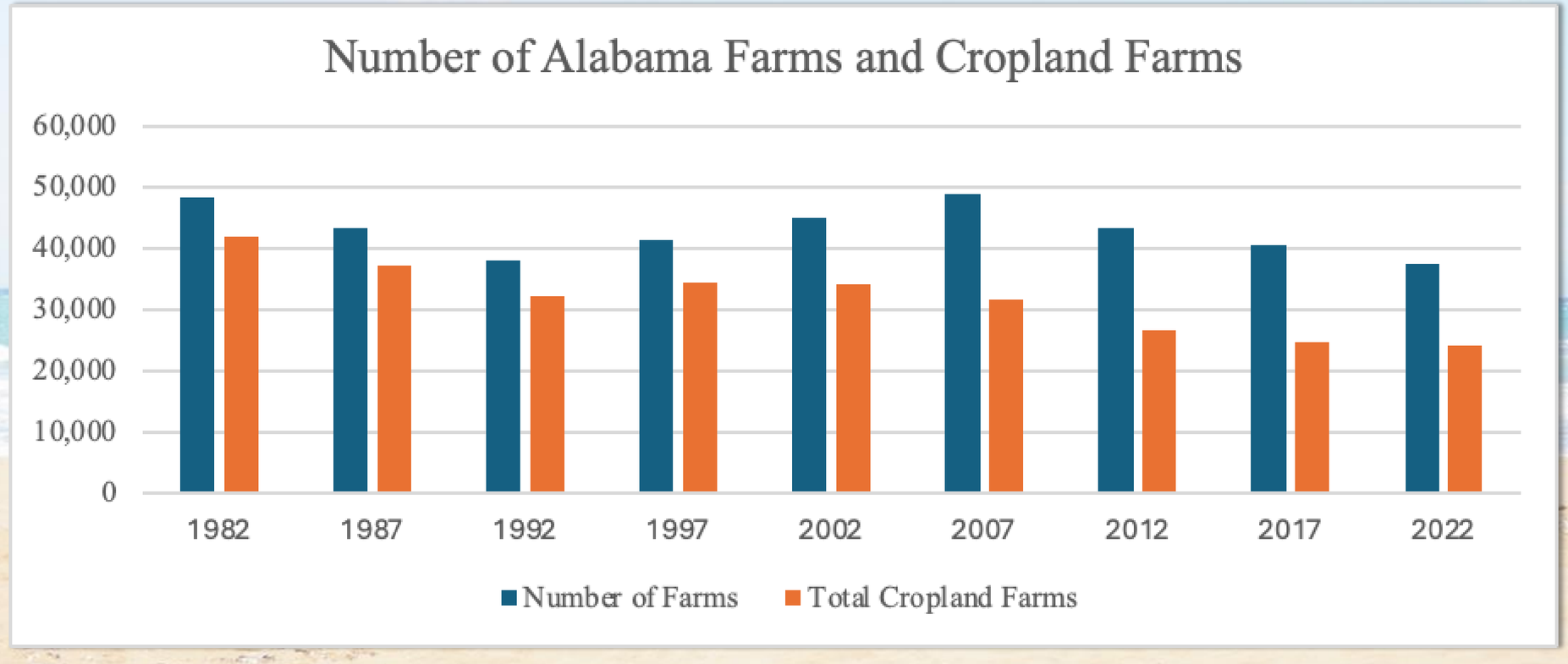
Source: USDA: National Agriculture Statistics Service (NASS)

*Comparative and cross-sectional analysis, as well as descriptive statistics, were utilized to categorize and isolate data to demonstrate relationships between USDA Database's, Alabama's GDP Output, NCES Database's and Alabama's Farm and Cropland Demographics.

Digging Deeper

What changes have occurred to warrant the demand for creation of new programs and the expansion of existing programs?

1982 – 2022 U.S. Census of Agriculture Number of Farms and Cropland Farms in Alabama

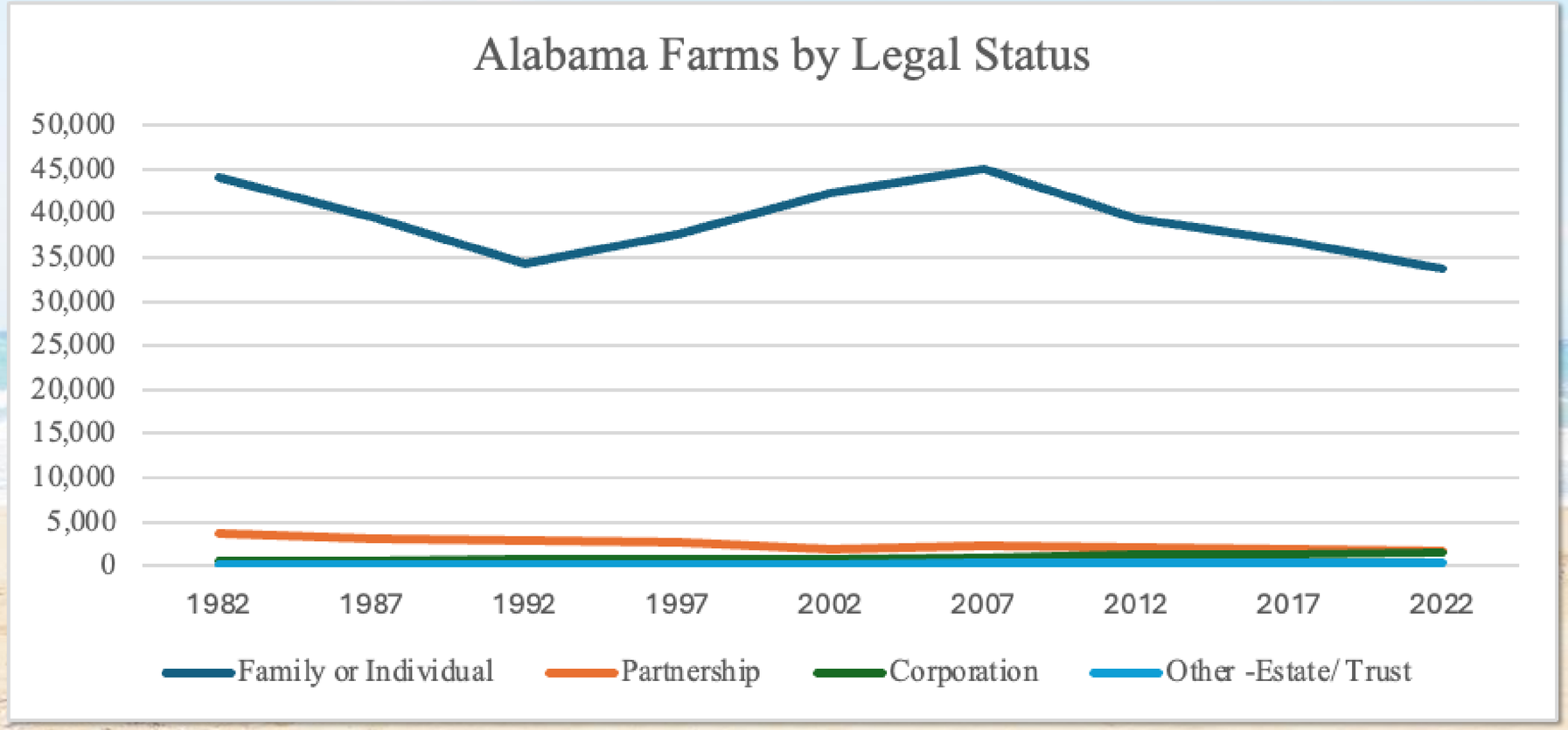


Source: USDA: National Agriculture Statistics Service (NASS)

Digging Deeper

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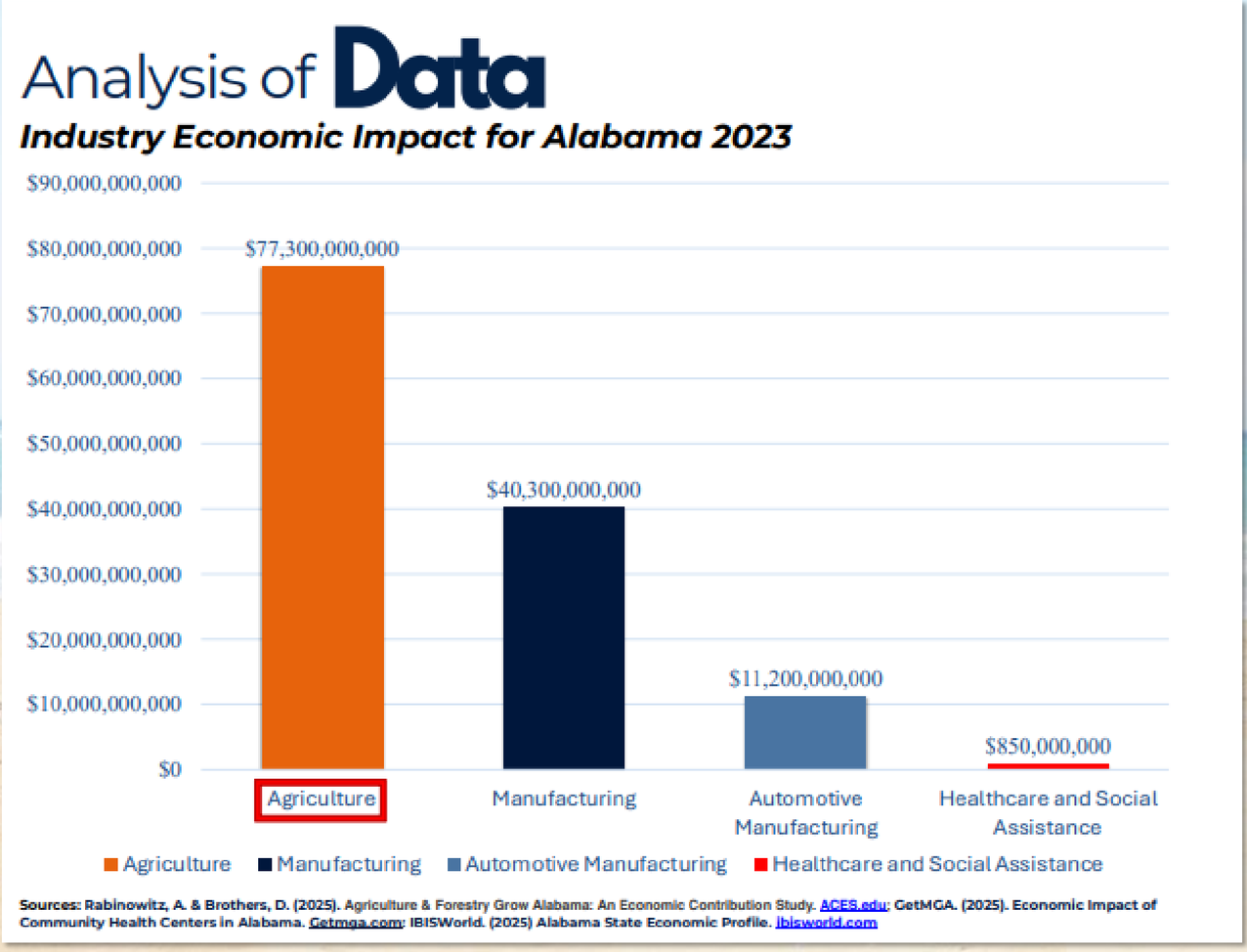
1982 – 2022 U.S. Census of Agriculture Farms by Legal Status in Alabama



Source: USDA: National Agriculture Statistics Service (NASS)

Digging Deeper

What changes have occurred to warrant the demand for creation of new programs and the expansion of existing programs?



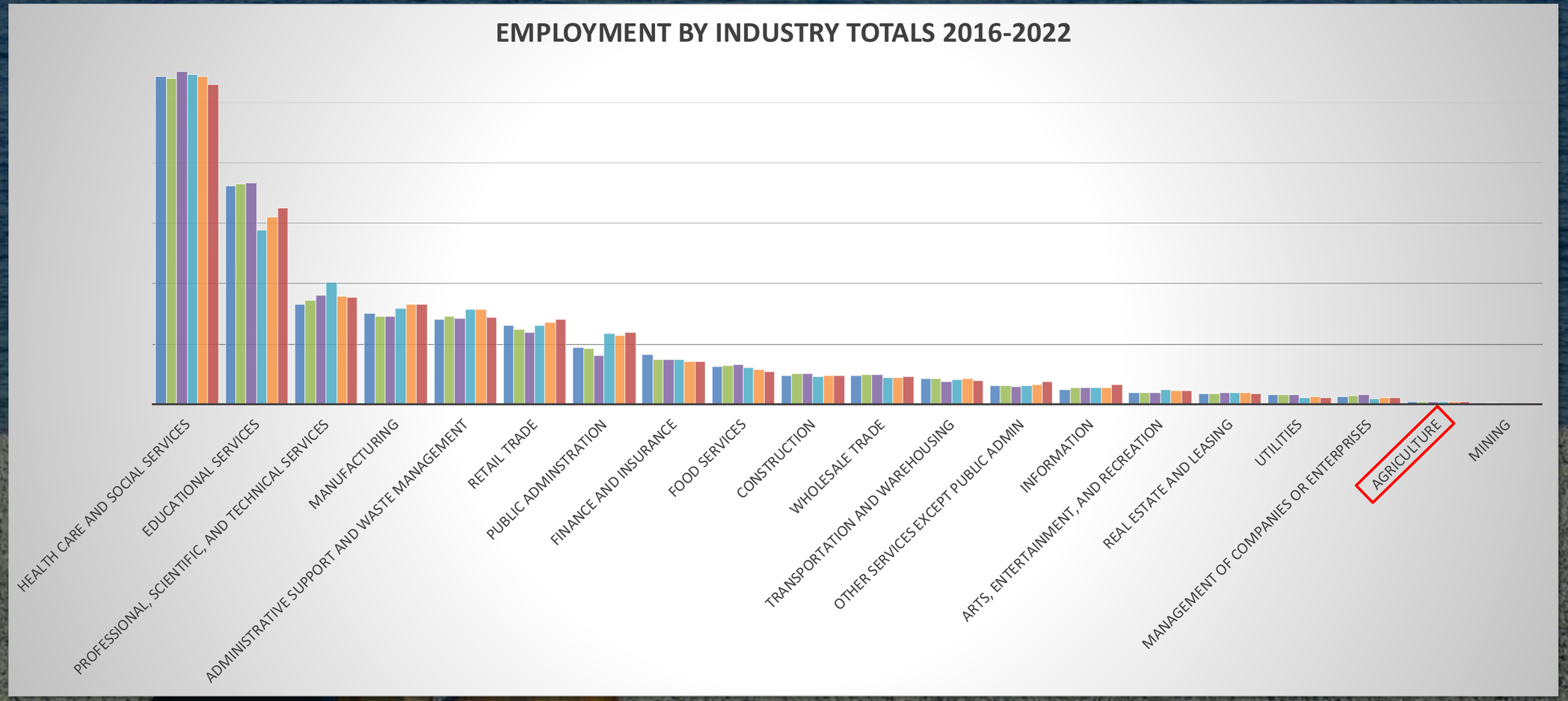
In Alabama, ***over 22 percent*** of the state's workforce is comprised of agricultural workers. According to the Alabama Department of Agriculture and Industries, agriculture and forestry contribute over ***$70 billion*** annually to Alabama's economy and ***employ more than 580,000 people.***

The state ranks ***second in the nation in broiler chicken*** production, ***third in peanut production***, and is a ***leading producer of cotton and soybeans***. Additionally, the poultry industry accounts for roughly $15 billion of the state's economic impact and supports over 86,000 jobs. Alabama also has the ***third-largest commercial timberland base*** in the United States, helping generate over ***$21 billion*** annually and employing around ***122,000 people.***

Source: Nichols, J. Career Pathways of Agriculture Students: An Introspective Look Through a 40-Year Lens. Pg. 56. JESSIE_LYNN_NICHOLS_MANUSCRIPT_FINAL_.pdf

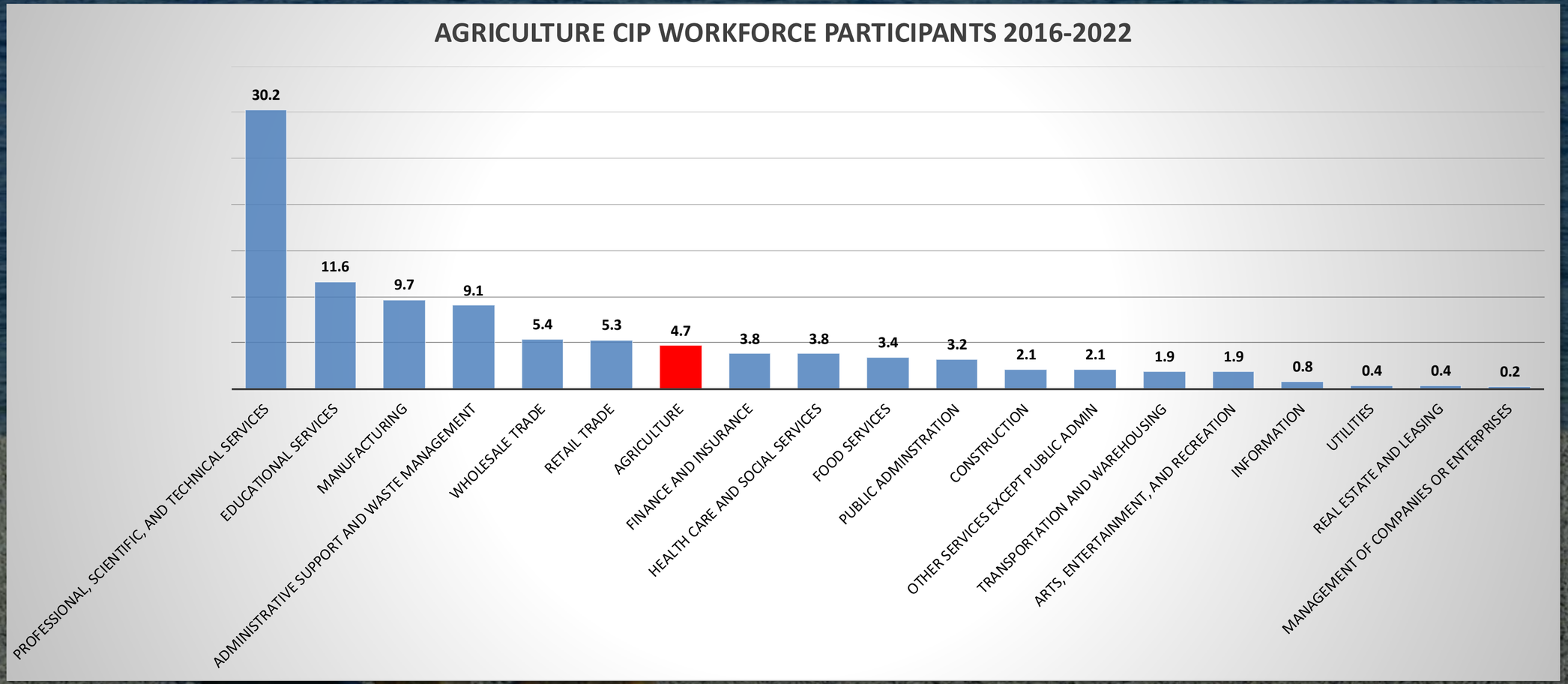
Digging Deeper

How do degrees obtained in agriculture, and related fields, impact the labor force? Specifically, Alabama's labor force?



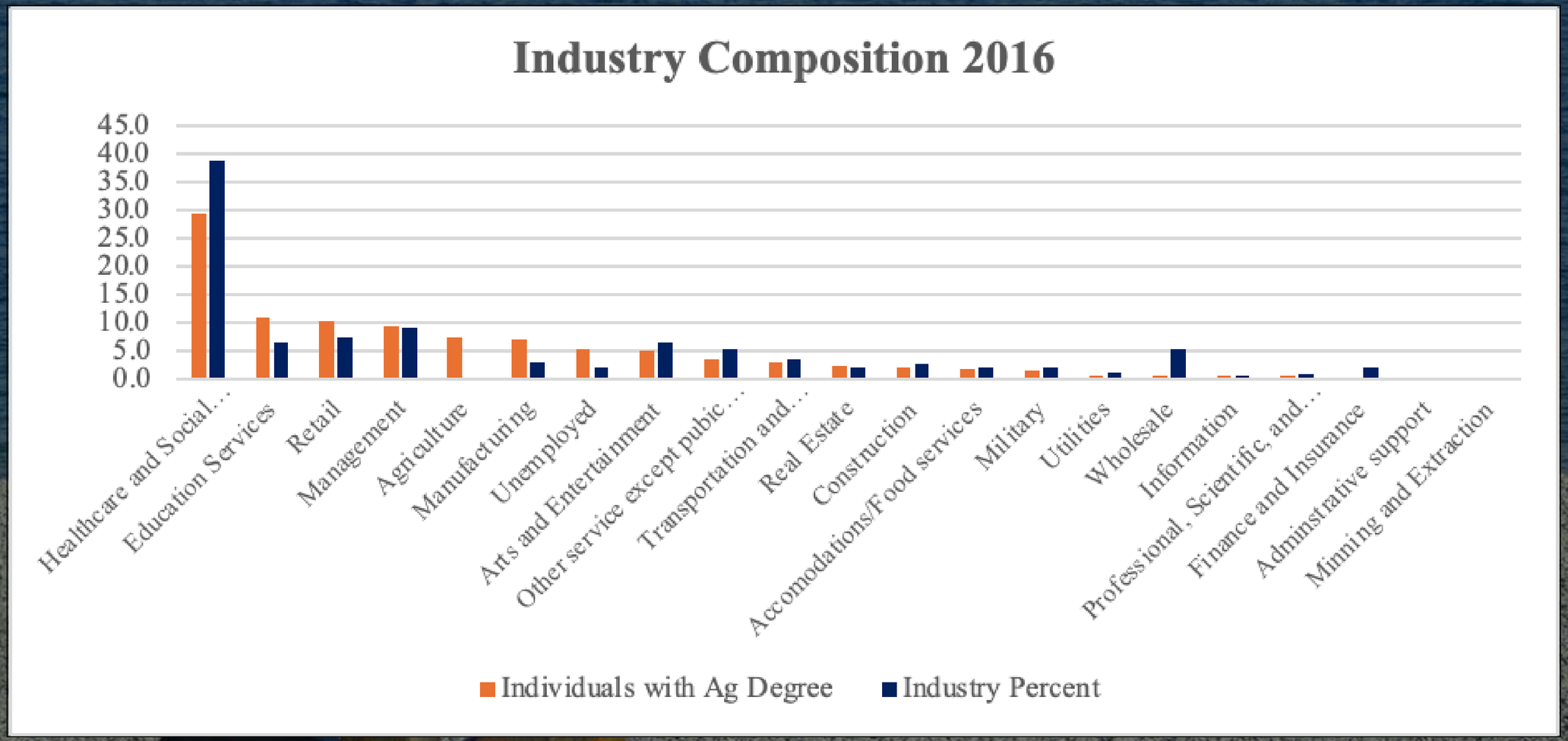
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Digging Deeper

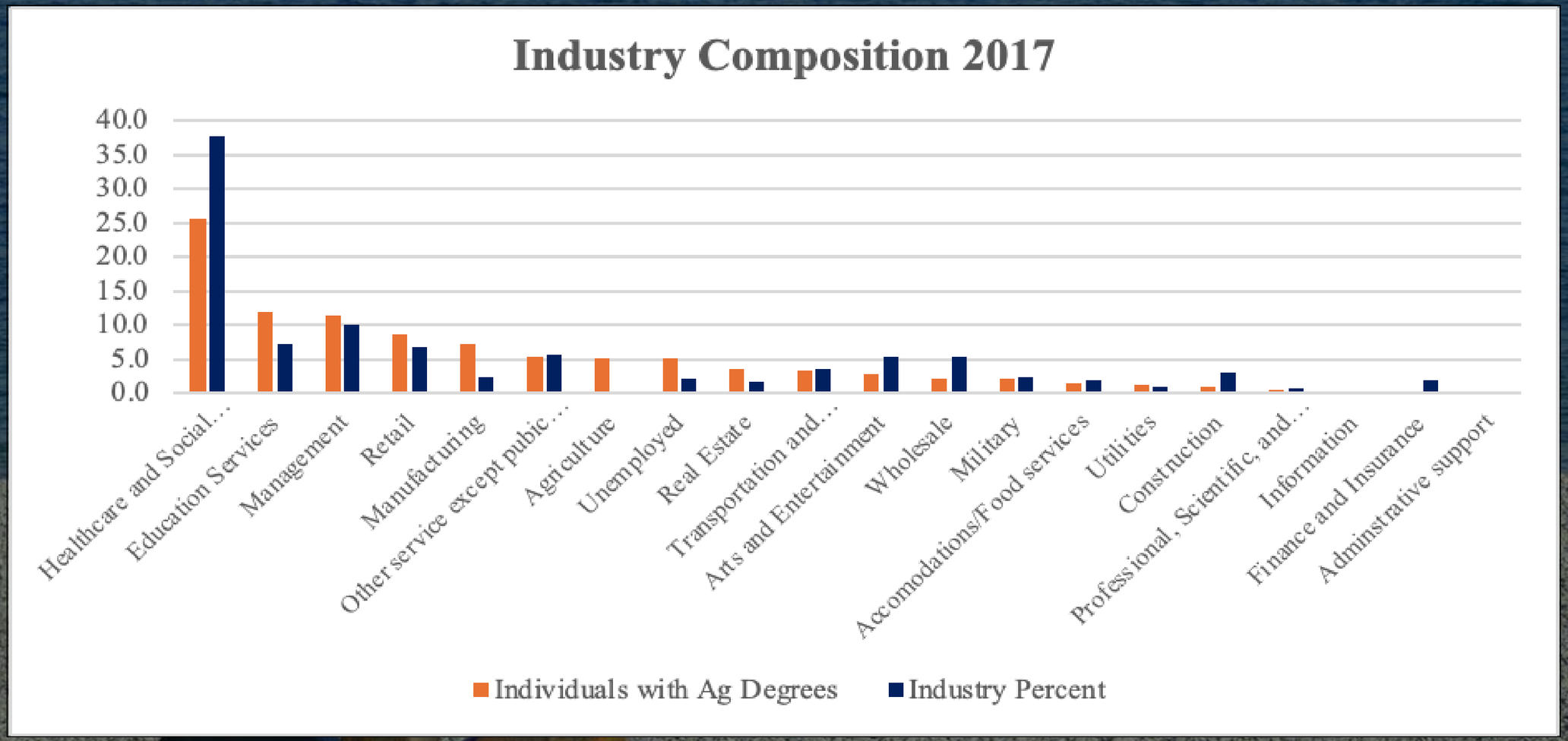
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Digging Deeper

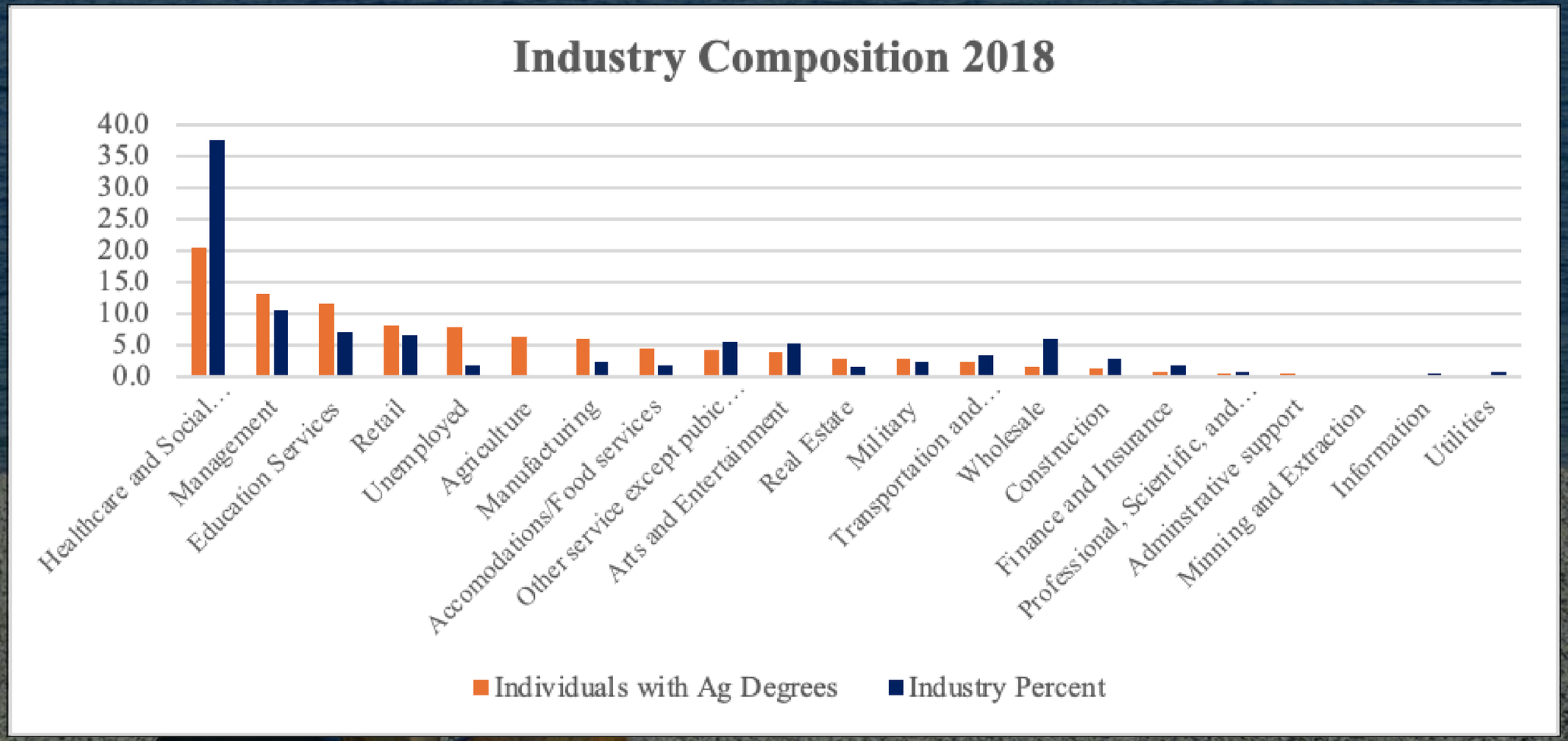
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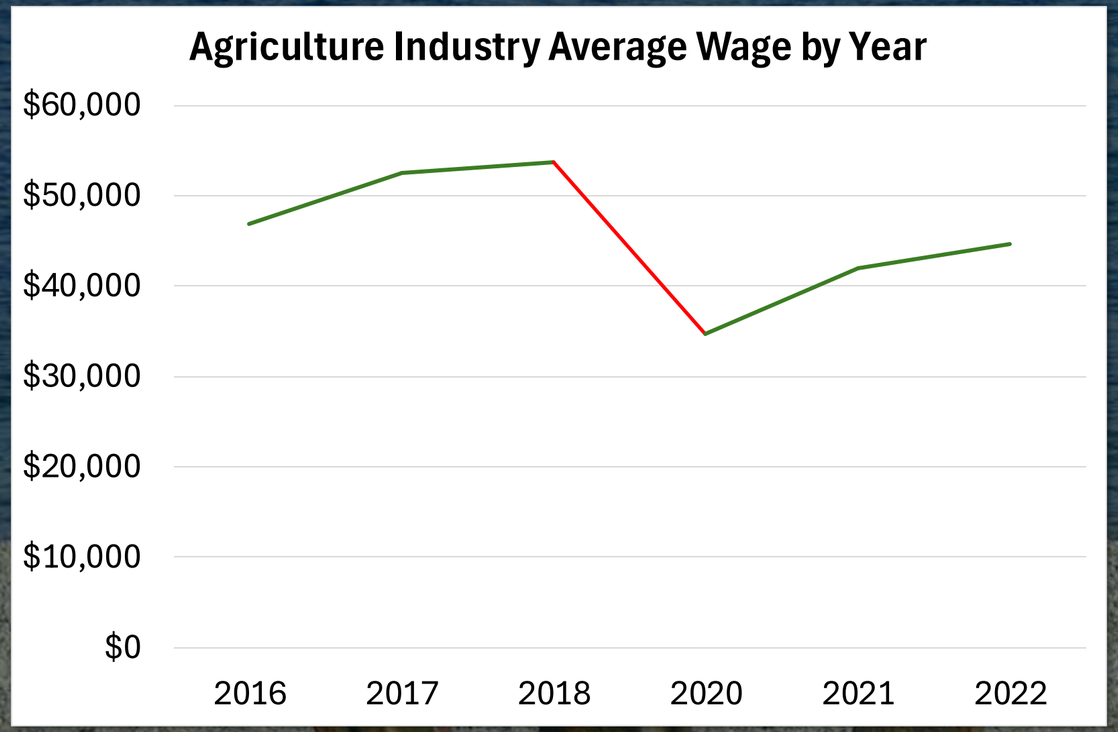


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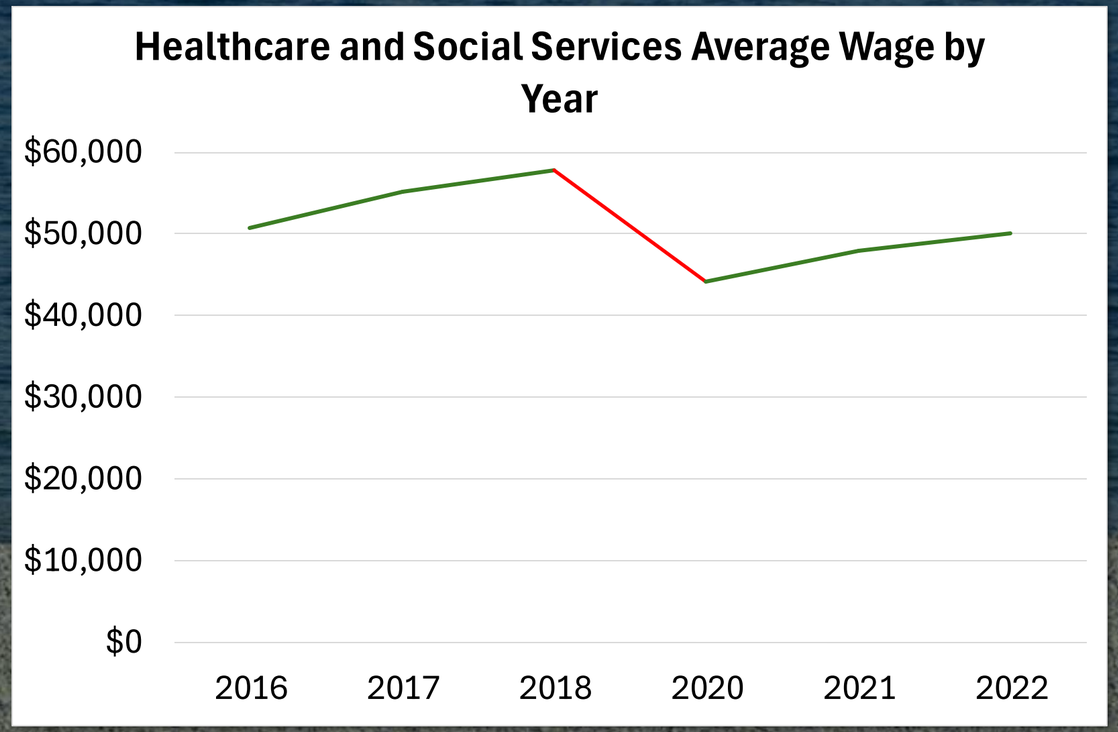
Digging Deeper

Wage Comparisons within Alabama's Industry Sectors

2nd to last in employment totals



1st in employment totals

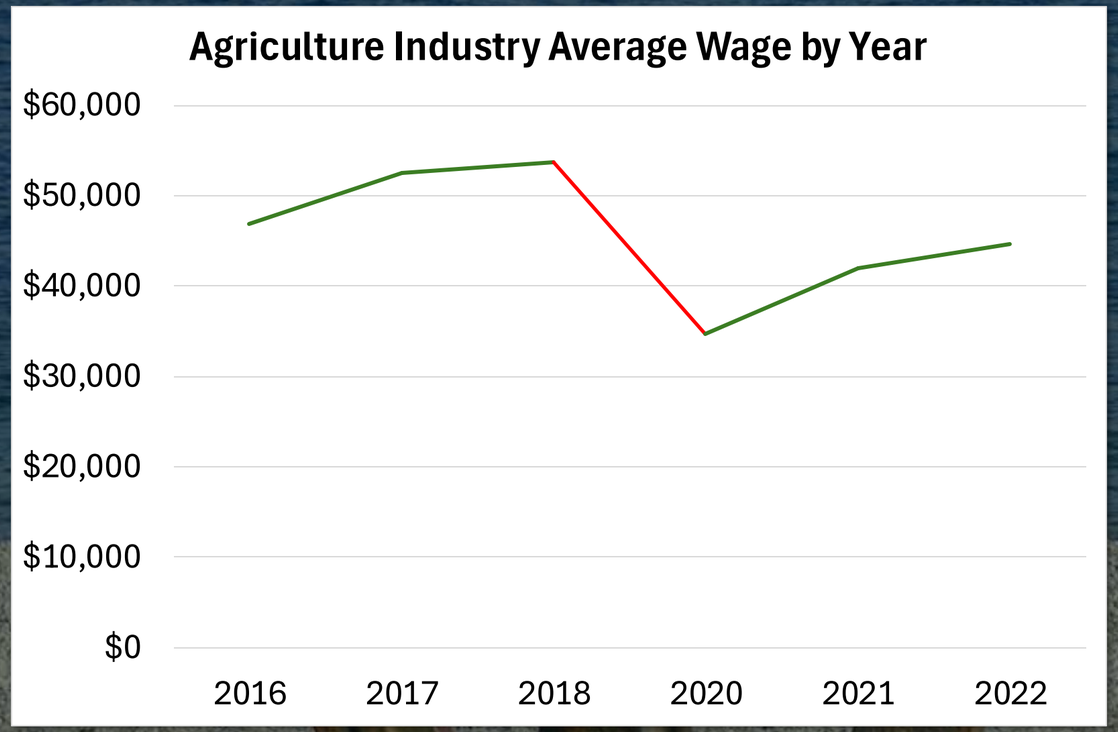


The average wage difference over 6 years equals **$5,222**

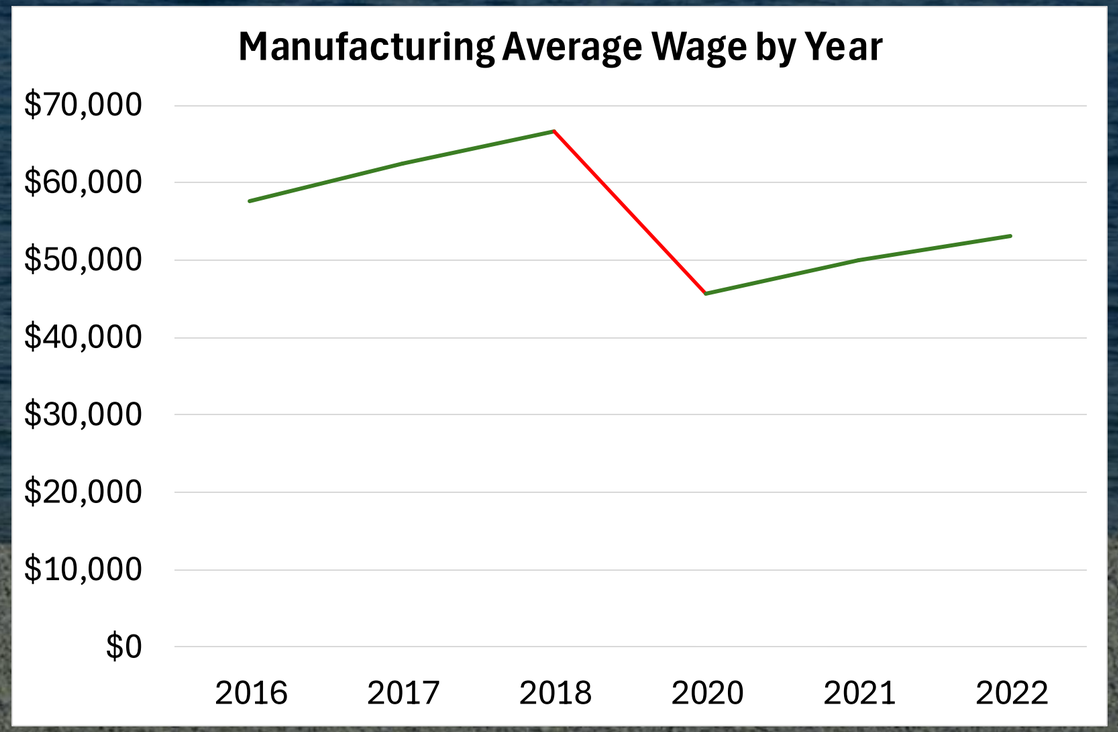
Digging Deeper

How do degrees obtained in agriculture, and related fields, impact the labor force? Specifically, Alabama's labor force?

2nd to last in employment totals



4th in employment totals

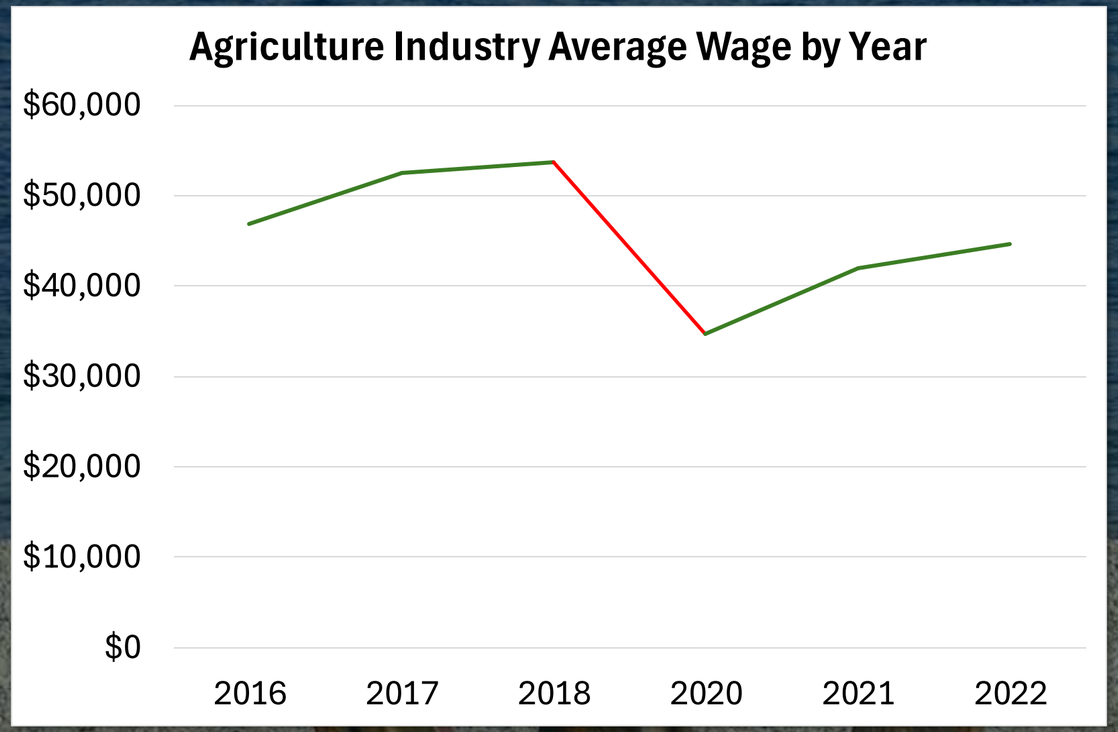


The average wage difference over 6 years equals **$10,141**

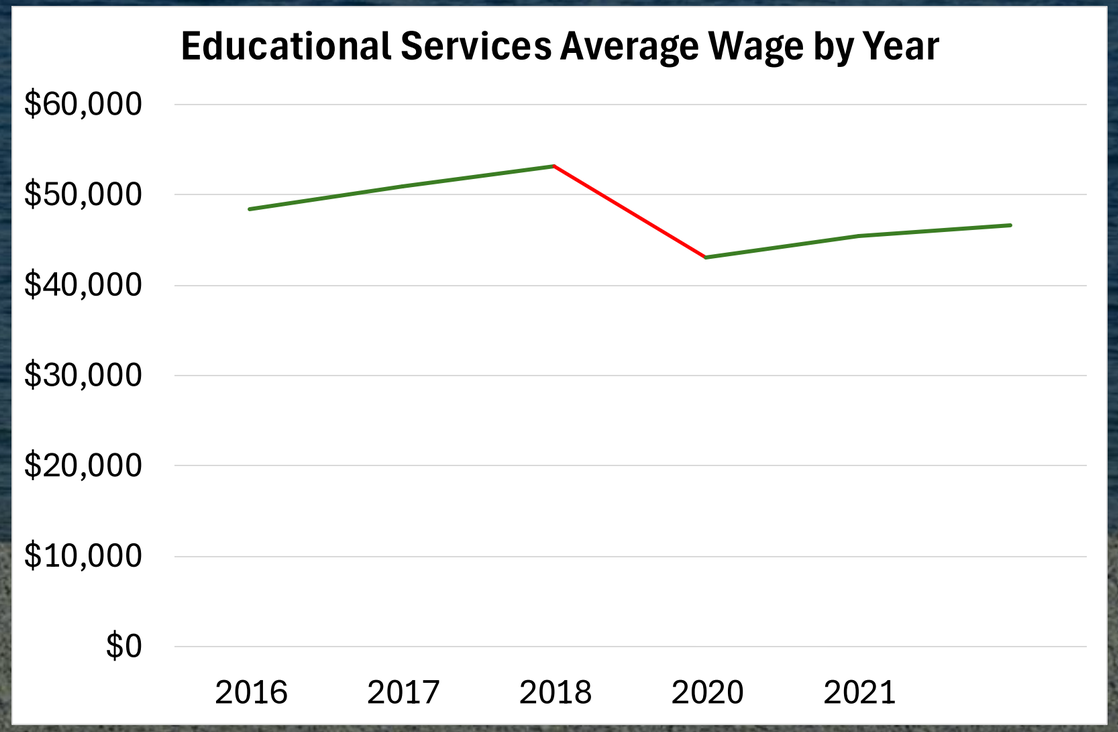
Digging Deeper

How do degrees obtained in agriculture, and related fields, impact the labor force? Specifically, Alabama's labor force?

2nd to last in employment totals



2nd in employment totals



The average wage difference over 6 years equals **$2,212**

Digging Deeper

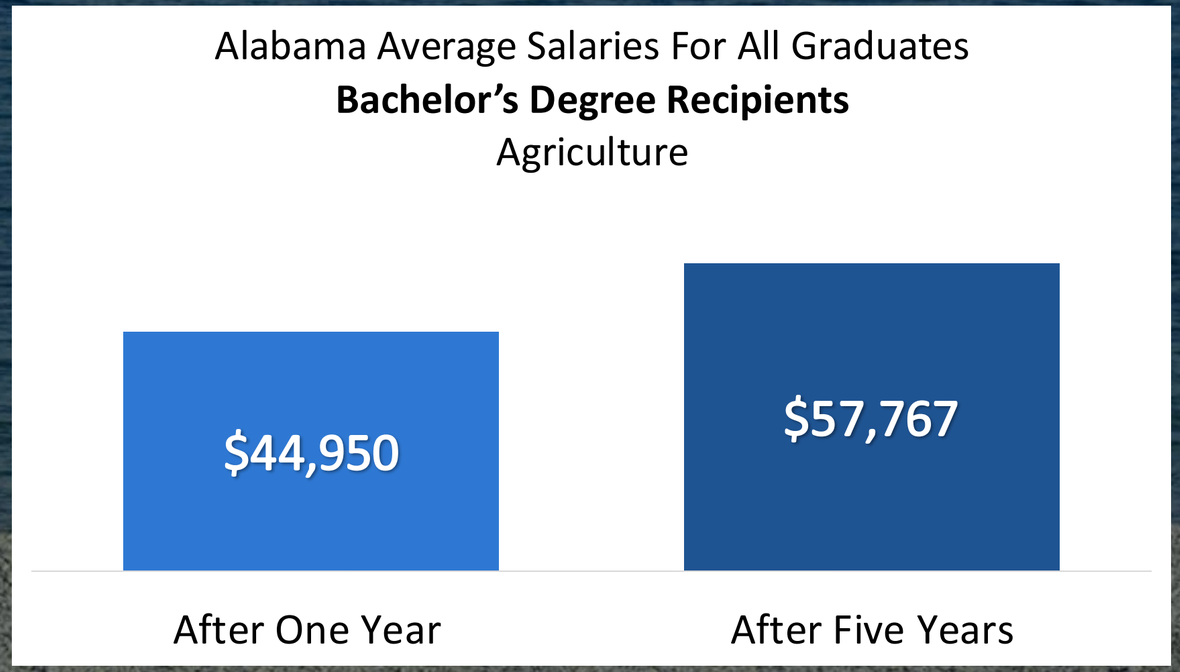
How do degrees obtained in agriculture, and related fields, impact the labor force? Specifically, Alabama's labor force?

Georgia



Source: United States Census Bureau. https://lehd.ces.census.gov/applications/pseo

Alabama



Source: Alabama Commission on Higher Educaiton. Employment Outcomes Report 2024. https://www.ache.edu/wp-content/Accountability/EmploymentOutcomesReport2024.pdf

Digging Deeper

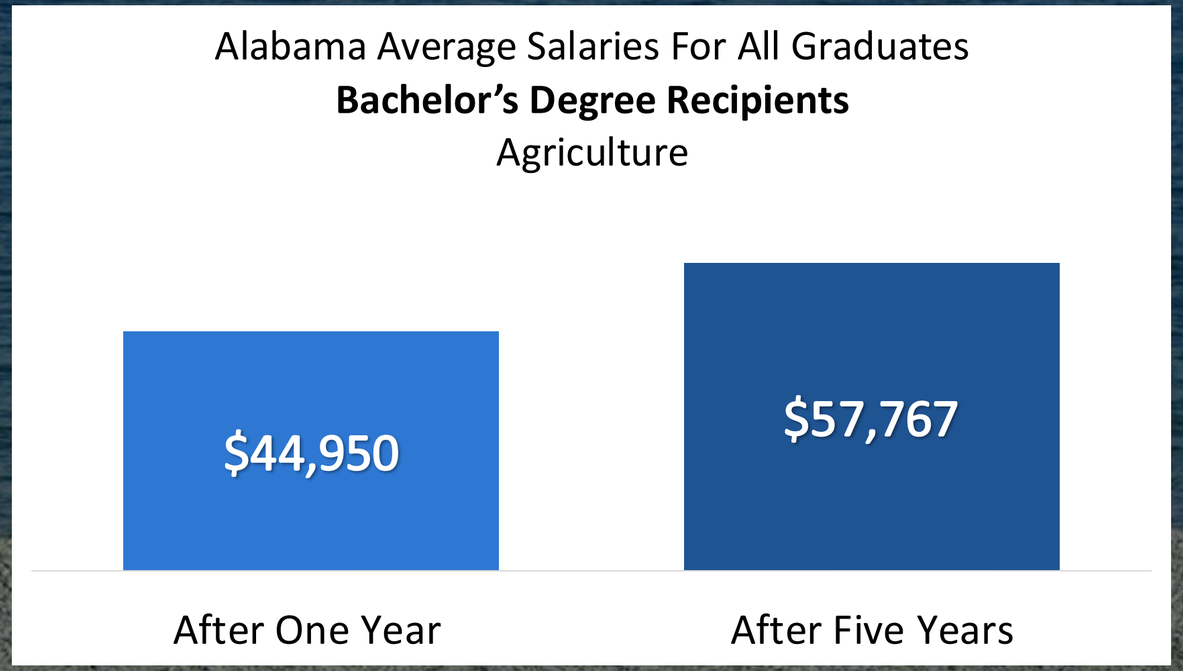
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Texas



Source: United States Census Bureau. https://lehd.ces.census.gov/applications/pseo

Alabama

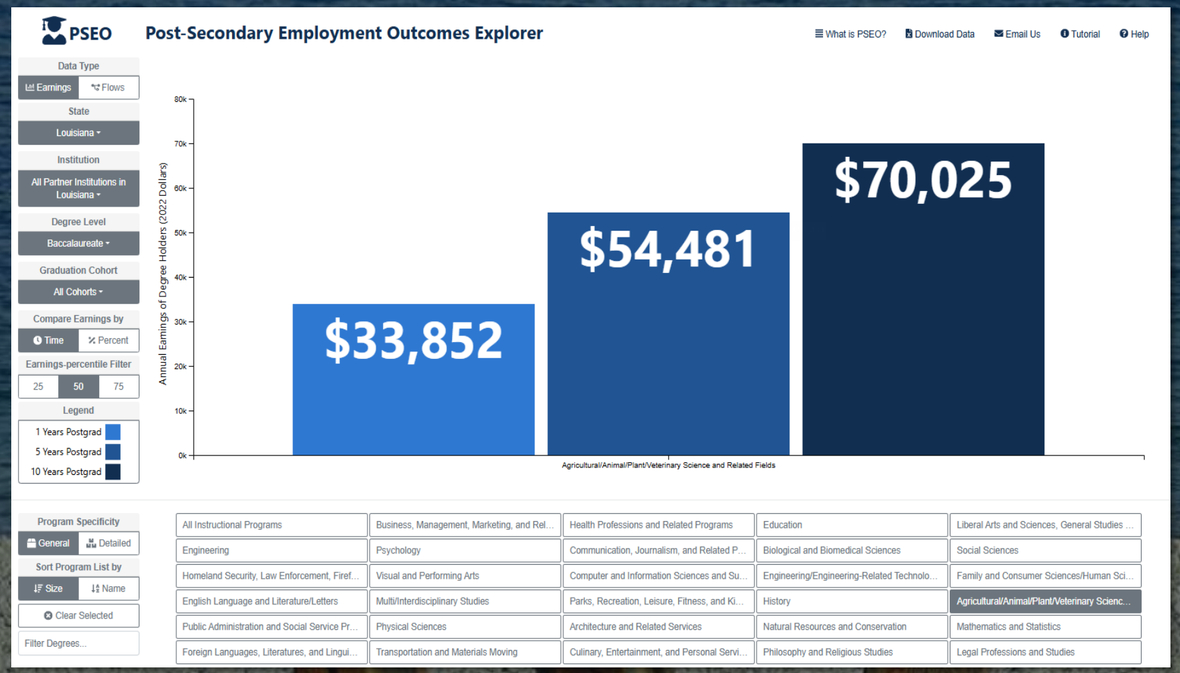


Source: Alabama Commission on Higher Educaiton. Employment Outcomes Report 2024. https://www.ache.edu/wp-content/Accountability/EmploymentOutcomesReport2024.pdf

Digging Deeper

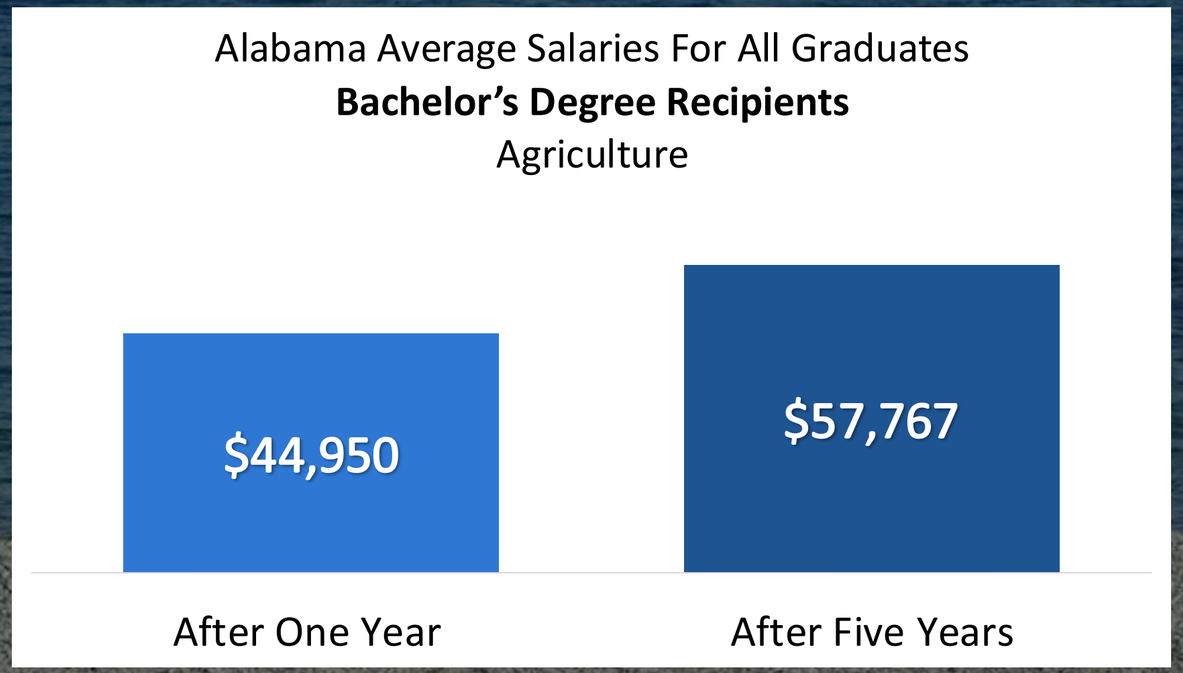
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Louisiana



Source: United States Census Bureau. https://lehd.ces.census.gov/applications/pseo

Alabama



Source: Alabama Commission on Higher Educaiton. Employment Outcomes Report 2024. https://www.ache.edu/wp-content/Accountability/EmploymentOutcomesReport2024.pdf

Digging Deeper

What relationships exist between inconsistent data practices and the misalignment of academic programs with state or federal policy goals?

Lambda Coefficient			Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Lambda	Symmetric	0.071	0.004	15.045	0.000
		Industry_Gen_New Dependent	0.347	0.020	14.690	0.000
		MCIP Dependent	0.005	0.002	3.161	0.002
	Goodman and Kruskal tau	**Industry_Gen_New Dependent**	0.388	0.011		<.001[c]
		MCIP Dependent	0.008	0.001		<.001[c]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

Digging Deeper

How have inaccuracies in institutional data reporting historically influenced policy decisions, legislative priorities, or funding allocations within higher education?

- **Misaligned Funding & Resource Allocation** – Inaccurate enrollment or completion reporting led to agriculture programs being under- or overfunded, regardless of true demand.
- **Workforce Policy Disconnect** – Errors in career outcome data distorted policymakers' understanding of workforce needs, steering priorities away from industry realities.
- **Policy Lag in Innovation** – Inaccurate or outdated data delayed the creation and support of new programs in agribusiness, ag tech, and sustainability fields.
- **Shaping of Legislative Narratives** – Data inaccuracies fueled misleading perceptions of agriculture's relevance and success, directly influencing legislative priorities and policy direction.

In what ways do data reporting errors affect the development and implementation of performance-based funding models, and what implications does this have for student success and workforce alignment?

- **Distorted Funding Outcomes –** Errors in retention, graduation, or job placement data misdirect funding away from programs and institutions actually driving student success.
- **Unintended Incentives –** Inaccurate reporting can push institutions to chase flawed metrics, prioritizing data compliance over meaningful student and workforce outcomes.
- **Program Viability Misjudged –** Faulty data may label strong programs as underperforming (or vice versa), leading to misguided cuts, expansions, or restructuring.
- **Workforce Misalignment –** Faulty employment data undermines policymakers' ability to link higher education outputs with real industry needs, weakening workforce development strategies.

Recommendations For

Practice

- **Reassess Funding Allocations**: Review funding for WIOA, AlabamaWorks support services, and the Alabama Department of Workforce.
- **Re-evaluate Industry Priorities**: Shift focus toward Alabama's top priority industries, such as agriculture, and minimize the tendency to lean towards the promotion of other industries more heavily than others.
- **Enhance Communication and Transparency**: Improve collaboration and information sharing between the ADOW, Business Owners, and policymakers about industry needs.
- **Engage Land-Grant Institutions**: Improve the agricultural industry's image, establish partnerships with the AWC and workforce businesses, and address gaps in employment, industry needs, and program vitality.
- **Audit Data Reporting Practices**: Annually audit public community colleges and institutions to ensure accurate CIP code assignments.
- **Conduct Internal Data Audits**: Review and correct data files from 2000 onward to resolve discrepancies.

Recommendations For

Research

- **Study Agricultural Salaries:** Research average salaries of agriculture-related workers in Alabama and competitive states (e.g., Georgia, Texas, Tennessee, Kentucky).

- **Explore Career Practices:** Investigate career exploration practices, behaviors, and opportunities to assess industry priorities in the state.

- **Analyze Program Vitality:** Research agricultural program effectiveness and cross-reference findings with historical CIP code discrepancies for deeper insights.

- **Highlight Youth Programs:** Conduct national research on youth programs like FFA and 4-H to demonstrate their workforce preparation benefits compared to standard education.



QUESTIONS?

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