NATIONAL CORN GROWERS ASSOCIATION

NCGA Economic Contribution Study

Corn Farming Contribution to the U.S. Economy

JULY 2024

A Study of the Economic Contribution of Corn Farming in the United States for 2023

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Executive Summary

Corn farming is one of the largest sectors in American agriculture. In 2023, corn farmers in the United States grew 15.3 billion bushels of corn for grain valued at $73.9 billion. For the 2023/24 marketing year the United States is the world's largest producer and exporter of corn. The nation's corn farmers bolster the economy and help build strong communities as evidenced by the results of the Study of the Economic Value of Corn Farming in the United States for 2023.

The contribution of corn farming and linkages extended across 524 different industry sectors in all 50 states. Corn farming for grain generated an estimated $151 billion in total economic output in 2023, with an estimated contribution of $62 billion to Gross Domestic Product (GDP), making the industry an essential contributor to the nation's agricultural and economic value chain. Driving the creation of over 600,000 jobs and providing $35 billion in wages, corn farming strengthens communities in rural America and across the entire nation.

Study Analysis

National Level Economic Contribution

Corn farming is one of the largest sectors in American agriculture. The United States Department of Agriculture (USDA) 2022 Census of Agriculture reports 289,382 farms growing corn for grain[1]. Corn farmers in the United States grew a record 15.3 billion bushels of corn for grain in 2023, valued at $73.9 billion[2]. Although the volume of production was a record high, the value of production was not a record because corn prices were lower for the 2023 crop compared to other years. A higher corn price would result in an even higher value of production with greater value impacts flowing throughout the economy. For the 2023/24 marketing year the United States is projected to be the world's largest producer and exporter of corn as shown in the June 2024 World Agricultural Supply and Demand Estimates Report[3].

The Economic Value of Corn Farming study considers the effect of corn farming for grain, the upstream supply chain linkages, and linkages to household spending of corn farmers and employees on the entire economy of the United States. The purpose of this study is to specifically evaluate the value corn farming brings to the U.S. economy. This study does not account for the downstream uses of corn or corn products such as processing in refining or milling, exports, or any end uses of corn.

Direct effects are valued based on activities happening at the corn farm level. Indirect effects are valued based on activities up the corn farming supply chain, such as input providers. Induced effects are valued based on activities filtered back into the economy by household spending of corn farmers and employees up the corn supply chain.

Direct Effect

Effects directly related to corn farming activities.

Indirect Effect

Effects stemming from activities up the corn farming supply chain.

Induced Effect

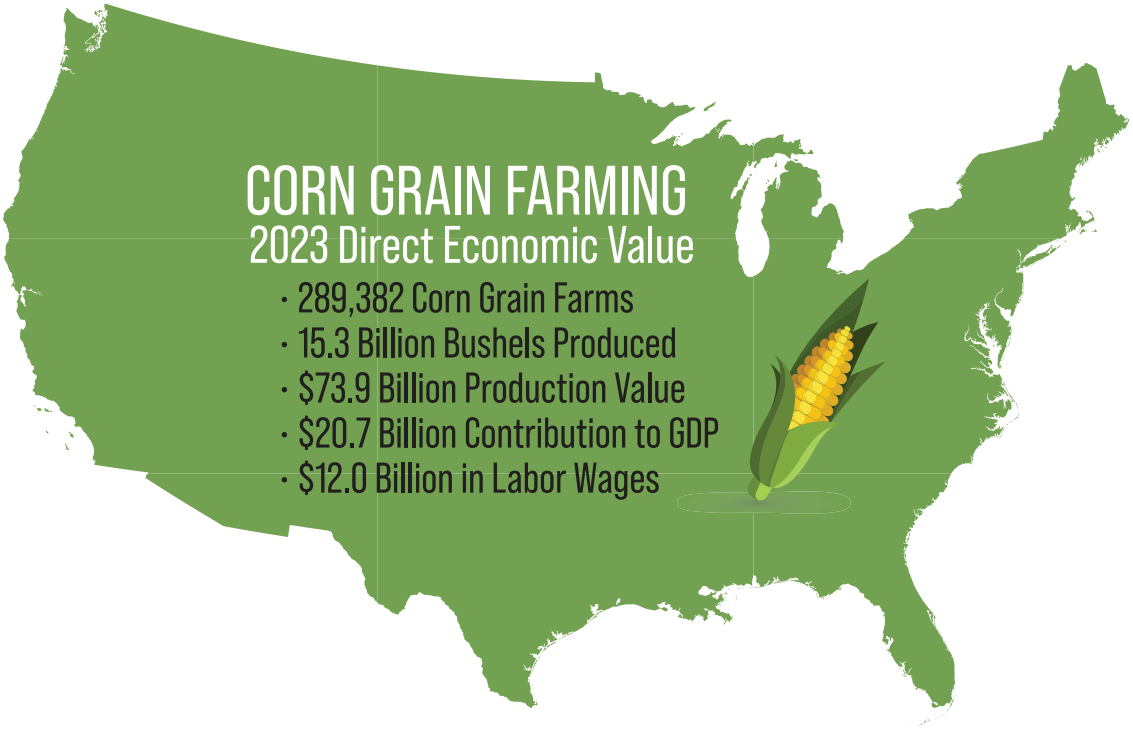
Effects of household spending by farmers and employees up the corn supply chain.

[1] *USDA National Agricultural Statistics Service, 2022 Census of Agriculture. Complete data available at www.nass.usda.gov/AgCensus*

[2] *USDA National Agricultural Statistics Service, Quick Stats Database. https://quickstats.nass.usda.gov/*

[3] *USDA World Agricultural Outlook Board, World Agricultural Supply & Demand Estimates, 12 June 2024. https://www.usda.gov/oce/commodity/wasde/wasde0624.pdf*

Direct Effect: In 2023, corn farmers in the United States grew 15.3 billion bushels of corn for grain valued at $73.9 billion, representing the direct output or industry production value. Corn farming provides direct labor wage and benefit equivalents of $12.0 billion. Corn farming directly contributes an estimated $20.7 billion in value added output, a measure of contribution to the nation's GDP. To put that in perspective, USDA estimates the output of all of America's farms contributed a total $203.5 billion[4], or about 0.7% of GDP, meaning corn farming alone made up 10% of the total farm-level contribution to GDP. Note that the overall contribution of agriculture is larger when linkages are considered, as is the overall contribution of corn farming as noted by the addition of indirect and induced impacts to create the total corn farming related contribution.



Indirect Effect: Other businesses and industries are suppliers to the corn farming industry as part of the corn farming upstream supply chain. These firms produce and sell items such as fertilizer, fuel, machinery, power, and more. Suppliers also provide services including transportation services, financial services, consulting services, marketing services, insurance services, and more. There are firms in 507 different industry sectors across all 50 states with indirect linkages to corn farming. These firms generated an estimated $47.3 billion in output production value and contributed an estimated $23.8 billion to GDP in 2023. Indirect labor and wage benefits totaled $13.2 billion.

[4]*USDA Economic Research Service, Ag and Food Sectors and the Economy, 19 April 2024. https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy/*

Induced Effect: Induced Effect: Household spending by farmers and employees of the industry and those upstream whose jobs are dependent on corn farmers are filtered back into the economy on a range of goods and services. There are firms in 524 different industry sectors across all 50 states with induced linkages to corn farming, some of the largest being housing, medical care, food, retail, and transportation-related spending. These firms generated an estimated $29.6 billion in output production value and contributed an estimated $17.4 billion to GDP in 2023. Induced labor and wage benefits totaled $9.5 billion.

Total Effect: The total effect is an estimated $150.8 billion in total output production value in 2023, with an estimated contribution of $61.9 billion to GDP, representing 0.23% of the total $27.361 trillion GDP reported by the Bureau of Labor Statistics[5]. Through upstream supply chain linkages, and linkages to household spending, corn farming contributes towards an annual average of 608,373 people working in corn farming, supplier jobs, and jobs induced by corn farming generating an estimated $34.7 billion in employee compensation and proprietor income. In total, corn grain farming results in $9.1 billion in tax revenues at the federal, state, and local levels.

Corn Grain Farming Total Contribution to the U.S. Economy

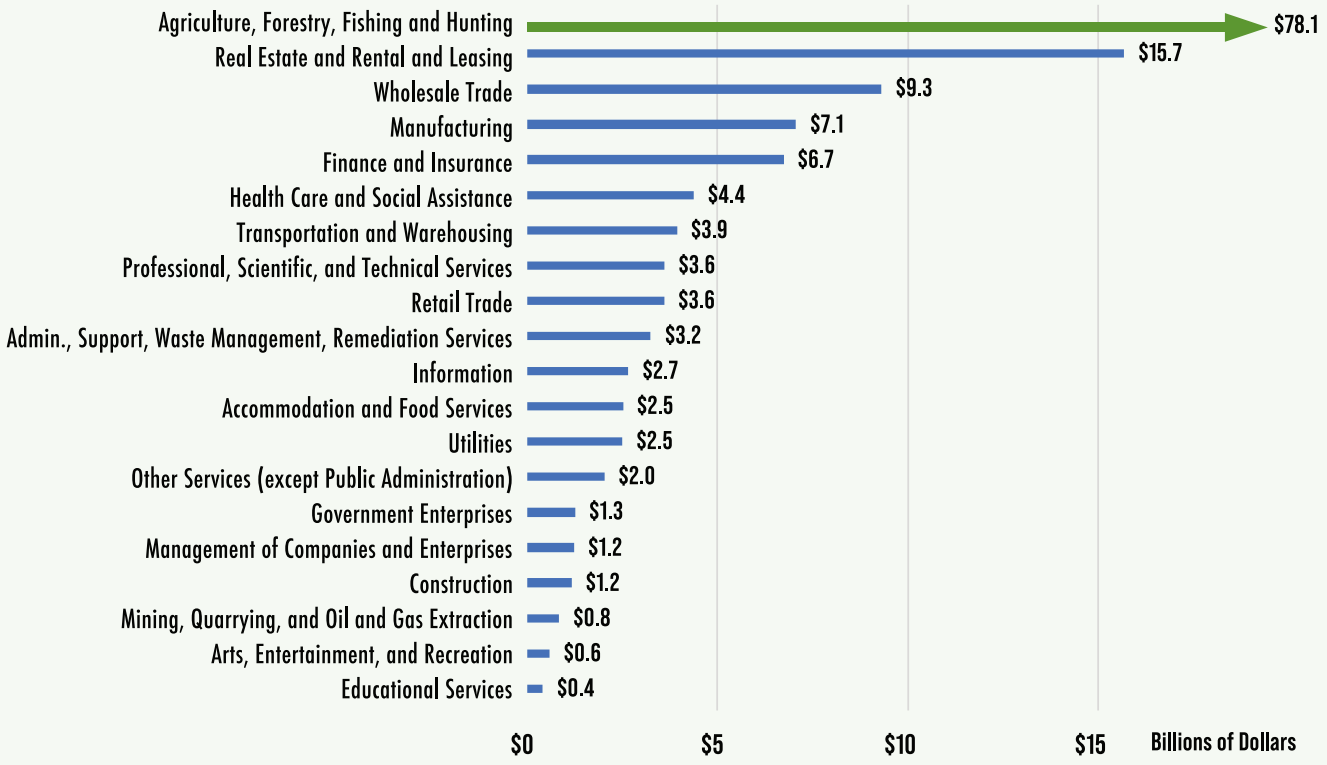
	Direct	Indirect	Induced	Total		Total
Output →Production Value	$73.9B	$47.3B	$29.6B	$150.8B	Linkages →Connected Industries	524
Value Added →GDP Contribution	$20.7B	$23.8B	$17.4B	$61.9B	Employment →Annual Average Jobs	608,373
Labor Income →Wages & Benefits	$12.0B	$13.2B	$9.5B	$34.7B	Labor Income →Federal, State, Local	$9.1B

[5]*U.S. Department of Commerce Bureau of Economic Analysis, Gross Domestic Product by State and Personal Income by State, 4th Quarter and Preliminary 2023, News Release, 28 March 2024.*

Industry Linkages: There are firms in 524 industry sectors across all 50 states and the District of Columbia with linkages to corn grain farming. These individual sectors are aggregated into twenty larger industry groupings by two-digits of their North American Industry Classification System (NAICS) code. The largest industry group is the Agriculture, Forestry, Fishing and Hunting group that totals $78.1 billion in output, largest driven by the $73.9 billion in direct corn production value. Besides the agriculture-based group, there are four industry groups that generate over $5 billion each related to corn grain farming:

- Real Estate and Rental and Leasing at $15.7 billion in output,
- Wholesale Trade at $9.3 billion in output,
- Manufacturing at $7.1 billion in output, and
- Finance and Insurance at $6.7 billion in output.

Corn Farming Total Economic Output Contribution by Aggregated Industry Sector Group



Data Source: IMPLAN® MODEL, 2022 Data, using inputs provided by the user and IMPLAN System (data and software), 16905 Northcross Dr., Suite 120, Huntersville, NC 28078 www.IMPLAN.com

State Level Economic Contribution

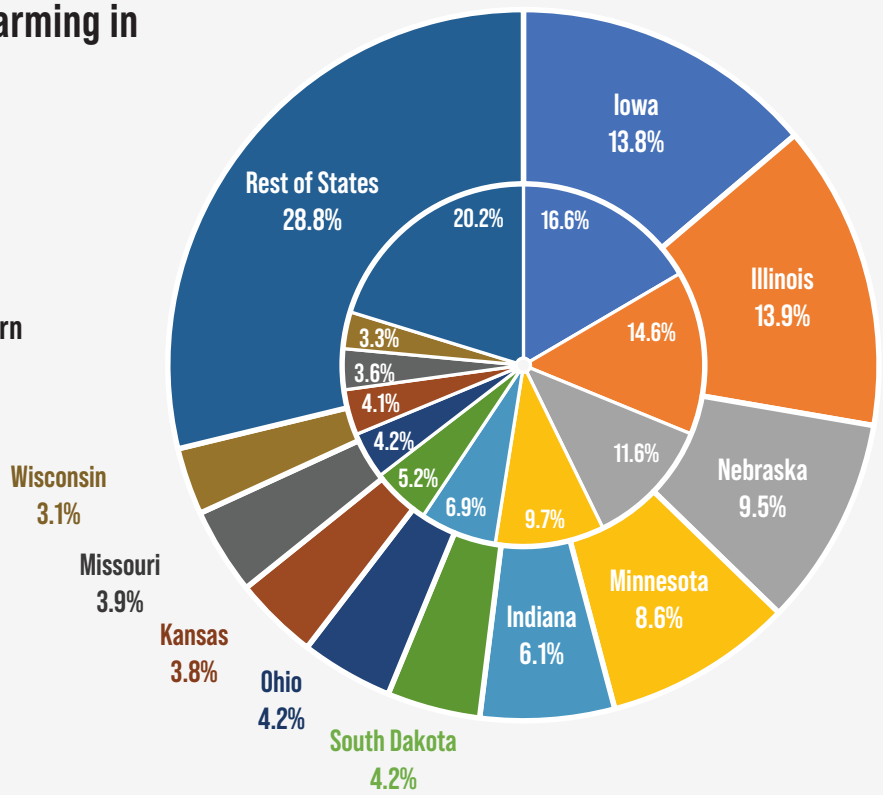
The national results are the sum of the state level impacts. The USDA reports corn production in 41 of the 50 states. As would be expected, the total economic value of corn farming is the largest in states with the highest corn production levels and generally lower in states without direct corn production. However, corn farming brings economic value to all 50 states and the District of Columbia given the linkages in its upstream supply chain and household spending of farmers and employees.

The 10 states with the largest production value for corn are within the top 11 states with the largest total economic output contribution due to corn farming along with its upstream supply chain and household linkages. In each of these states the Agriculture, Forestry, Fishing and Hunting industry group is the source of at least 50% of the state's total economic output due to corn farming. California is the exception to the general trend with a large economic output due to corn farming relative to the corn production in the state, coming in as the sixth largest state contributing to total economic output due to corn farming. This is due to considerable contributions from indirect and induced linkages in the Real Estate and Rental and Leasing industry group and the Finance and Insurance industry group, which together make up more than one-quarter of the total output value due to corn farming, while the Agriculture, Forestry, Fishing and Hunting industry group makes up less than 2% of the state total.

Comparison of Corn Production Value to Total Output Contribution Due to Corn Farming in 10 Largest Corn States

Inner CIrcle: State Share of Total U.S. Corn Production Value

Outer Circle: State Share of Total U.S. Output Contribution Due to Corn Farming



Data Source: IMPLAN® MODEL, 2022 Data, using inputs provided by the user and IMPLAN System (data and software), 16905 Northcross Dr., Suite 120, Huntersville, NC 28078 www.IMPLAN.com

Corn Grain Farming Total Contribution to the U.S. Economy by State & State Corn Production Value

	Output	GDP	Wages	Jobs	Production Value
Alabama	$653.6M	$317.5M	$198.3M	3,240	$278.1M
Alaska	$24.9M	$14.6M	$5.4M	76	
Arizona	$365.4M	$187.1M	$100.2M	1,725	$54.8M
Arkansas	$1,565.7M	$597.4M	$376.3M	8,368	$789.8M
California	$6,791.9M	$4,069.6M	$2,230.5M	30,146	$43.8M
Colorado	$2,128.6M	$790.2M	$575.9M	10,152	$656.3M
Connecticut	$83.2M	$44.9M	$27.0M	324	
Delaware	$223.7M	$190.4M	$76.1M	721	$159.3M
District of Columbia	$47.5M	$32.8M	$23.8M	181	
Florida	$1,172.5M	$621.2M	$324.7M	5,679	$52.9M
Georgia	$1,075.5M	$535.8M	$268.8M	4,384	$440.2M
Hawaii	$66.1M	$36.7M	$21.3M	434	
Idaho	$393.4M	$189.3M	$89.0M	1,539	$157.6M
Illinois	$20,970.4M	$9,480.8M	$5,274.2M	75,038	$10,812.4M
Indiana	$9,205.5M	$4,015.2M	$2,289.5M	38,198	$5,066.3M
Iowa	$20,817.0M	$7,223.7M	$3,603.2M	60,757	$12,234.4M
Kansas	$5,763.0M	$1,966.5M	$1,253.8M	20,649	$3,003.0M
Kentucky	$2,625.5M	$1,127.3M	$701.7M	17,488	$1,374.5M
Louisiana	$1,614.8M	$564.2M	$328.7M	6,626	$660.5M
Maine	$24.5M	$10.2M	$5.8M	98	
Maryland	$626.8M	$323.0M	$162.2M	3,350	$355.7M
Massachusetts	$134.5M	$75.2M	$47.6M	542	
Michigan	$2,946.7M	$1,328.0M	$704.5M	15,130	$1,488.1M
Minnesota	$12,982.2M	$4,956.4M	$2,649.6M	47,461	$7,188.2M
Mississippi	$1,476.3M	$460.3M	$348.0M	8,197	$745.6M
Missouri	$5,929.6M	$2,260.7M	$1,254.1M	31,463	$2,695.2M
Montana	$206.6M	$90.1M	$48.0M	955	$42.5M
Nebraska	$14,375.8M	$5,170.0M	$2,904.7M	45,435	$8,558.6M
Nevada	$173.7M	$94.7M	$51.9M	898	
New Hampshire	$25.2M	$13.3M	$9.2M	111	
New Jersey	$270.6M	$152.9M	$85.1M	1,364	$54.1M
New Mexico	$148.7M	$30.0M	$41.3M	912	$43.0M
New York	$1,247.0M	$812.3M	$389.4M	5,717	$472.2M
North Carolina	$1,844.2M	$755.4M	$454.7M	7,897	$760.7M
North Dakota	$4,104.6M	$1,426.8M	$913.0M	1,450	$2,418.1M
Ohio	$6,333.0M	$2,580.2M	$1,418.9M	31,923	$3,096.7M
Oklahoma	$1,133.1M	$352.5M	$253.9M	5,426	$286.2M
Oregon	$437.9M	$234.8M	$129.4M	2,194	$79.4M
Pennsylvania	$1,118.7M	$595.4M	$303.9M	6,091	$544.5M
Rhode Island	$11.1M	$5.7M	$3.6M	52	
South Carolina	$619.2M	$209.8M	$132.4M	3,228	$286.1M
South Dakota	$6,392.5M	$2,428.8M	$1,488.6M	21,238	$3,844.1M
Tennessee	$1,643.0M	$610.2M	$360.2M	12,541	$739.1M
Texas	$4,450.4M	$1,825.9M	$1,142.0M	23,491	$1,434.7M
Utah	$142.4M	$59.7M	$34.6M	664	$29.5M
Vermont	$10.4M	$3.9M	$2.4M	37	
Virginia	$624.6M	$306.4M	$133.1M	3,833	$312.0M
Washington	$843.4M	$486.5M	$245.5M	3,499	$121.5M
West Virginia	$60.0M	$18.7M	$7.7M	551	$24.1M
Wisconsin	$4,598.3M	$2,169.7M	$1,105.1M	22,749	$2,431.6M
Wyoming	$233.4M	$91.3M	$52.9M	1,051	$51.5M
United States	$150.8B	$61.9B	$34.7B	608,373	$73.9B

Study Methodology and About IMPLAN:

The Corn Economic Value Study estimates the contributions made by the corn farming industry to the United States economy in 2023. This study was conducted by Krista Swanson, Lead Economist of the National Corn Growers Association using IMPLAN, a regional economic analysis software and data application that is designed to estimate the impact or ripple effect of a given economic activity or the contribution of some existing activity within a specific geographic area.

Key assumptions were made by the National Corn Growers Association. The USDA National Agricultural Statistics Service value of corn production data by state for 2023 was the initial input in IMPLAN and applied to relevant industry and final demand multipliers to estimate contribution to GDP, labor income, and employment resulting from corn grain farming.

IMPLAN utilizes an economic modeling technique called Input-Output analysis and a Social Accounting Matrix, which is a type of applied economic analysis that tracks the interdependence among various producing and consuming industries of an economy and the spending of households. It measures the relationship between a given set of demands for final goods and services and the inputs required to satisfy those demands.

Economic value calculations are derived from backward, or upstream linkages connecting corn farmers to other industries in every state. For example, a corn farmer in the agriculture sector purchases goods and services from suppliers in many industries including inputs like fertilizer, fuel, machinery, transportation services, financial services, marketing services, and many others. The input-output analysis does not look at forward, or downstream linkages.

The households providing labor and management resources for corn farming are also linked in the model, representing induced effects. Workers in direct and indirect industries spend earnings on goods and services in the region, representing a critical component of the economy.

Economists at IMPLAN provided supporting services including the recommendation to use Multi-Regional Input-Output (MRIO) Analysis. MRIO analyses utilize interregional commodity trade and commuting flows to quantify the demand changes across regions stemming from a change in production and/or income in another region. It measures the economic interdependence of regions. The direct, indirect, and induced impacts on each state were modeled independently and then summed.

IMPLAN has been a standard tool for academic and professional economists for decades. The methods used to produce IMPLAN's economic data set and economic impact estimates have been widely published both in professional publications as well as peer-reviewed academic journals. Many of these methods are considered standard best practices in a wide variety of applied economic fields today. Some of the language used in this report was provided by IMPLAN as part of the IMPLAN Report Toolkit[6].

[6]*Clouse, Candi. "IMPLAN Report Toolkit." IMPLAN Support Site, IMPLAN Group, LLC, 13 March 2020, Support.IMPLAN.com/hc/en-us/articles/360044985833-IMPLAN-Report-Toolkit.*