# *The Value of Indiana Agriculture*

A State and Regional Report on the Economic Contribution of Farms, Forests and Related Industries







October 2019

INDIANA SOYBEAN ALLIANCE®

KELLEY SCHOOL OF BUSINESS
INDIANA UNIVERSITY
Indiana Business Research Center

# *The Value of Indiana Agriculture:*

## A State and Regional Report on the Economic Contribution of Farms, Forests and Related Industries

Prepared for
Indiana Soybean Alliance

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# Executive Summary

Indiana is home to 56,650 farms covering 14.7 million acres. Add in another 4.5 million acres of woodlands, and Hoosier farms and forests combined to cover roughly 84 percent of the state's total land area. Given this extensive reach, it is no surprise that agriculture and forestry continue to be an economic force in the state. Indiana's agriculture economy also includes a substantial processing and manufacturing sector that transforms the state's agriculture production into a wide variety of products. These industries—which include businesses engaged in activities such as grain milling, animal processing or sawmills—employ more than 33,000 Hoosiers.

This report will highlight the latest data on the state's agriculture production and provide comprehensive estimates of the total economic footprint of Indiana agriculture. The analysis includes estimates of the total jobs, employee compensation and gross domestic product (GDP) directly tied to agriculture-related industries, as well as the economic ripple effects that these activities generate in other industries around the state. The estimates are presented at the state level, as well as for Indiana's congressional districts and its U.S. Department of Agriculture (USDA) crop reporting districts.

## Key Findings

- The state's agriculture industries combined to employ an estimated 108,100 direct workers in 2017. Add in the economic ripple effects of agriculture—which refer to supply chain purchases and the household spending of workers—and the total employment impact climbs to 200,070 jobs in Indiana. These jobs combine to generate nearly $10.5 billion in compensation for these workers.
- The ratio of direct agriculture jobs to the total employment impact yields a multiplier of 1.85, meaning that every job directly tied to agriculture supports an additional 0.85 jobs in the state (or every 100 agriculture jobs create another 85 jobs statewide).
- The combined effects of agriculture (i.e., direct effects + ripple effects) contributed an estimated $17.4 billion to Indiana's GDP (or value added). The GDP multiplier of 2.02 indicates that every dollar of direct value added produced by Indiana agriculture generates another dollar of GDP for other industries in the state.
- The total GDP contributions of agriculture are split almost evenly between agricultural production industries ($8.6 billion) and agriculture-related processing and manufacturing ($8.8 billion).
- The full employment and GDP impacts of Indiana agriculture both amount to roughly 5 percent of the state total for each measure.
- Looking at specific industries, grain and hog production support the largest number of jobs, with these two industries combining to account for 28 percent of agriculture's total employment impact in the state. As for GDP, soybean and grain farming lead the way, with these two industries together responsible for 24 percent of the total value added generated by Indiana agriculture.
- Indiana ranks 10th among states in crop and livestock production with total sales at $11.1 billion in 2017, according to the latest USDA Census of Agriculture. The state ranked in the top six nationally in the production of corn, soybeans, and hogs and pigs.

# Indiana Commodity Production in 2017

Hoosier farmers combined to sell more than $11.1 billion worth of agricultural commodities in 2017. This mark ranks as the 10th-highest sales total among states (see **Figure 1**). With $45.2 billion in sales in 2017, California is far and away the nation's top agricultural producer, followed by Iowa ($29.0 billion) and Texas ($24.9 billion). Indiana ranked just behind North Carolina ($12.9 billion) and Wisconsin ($11.4 billion), but ahead of Missouri ($10.5 billion), South Dakota ($9.7 billion) and Arkansas ($9.7 billion).

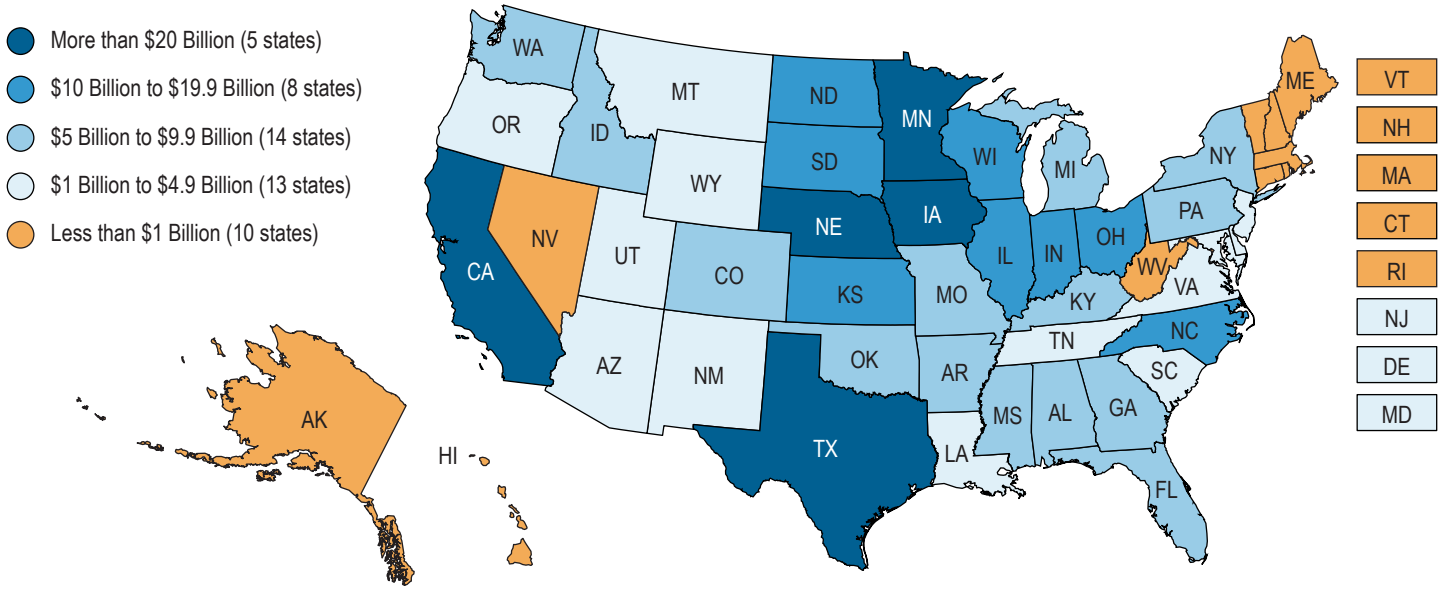
While Indiana produces a broad range of commodities, the state's farmers specialize in corn and soybean production (see **Table 1**). With sales in each category in excess of $3 billion, Indiana ranked among the top 5 states for these commodities in 2017, and these two crops combined to account for 59 percent of the state's total value

**Table 1: Value of Indiana Agricultural Production by Industry, 2017**

| | Number of Farms | Value of Sales ($ million) | U.S. Rank |
|---|---|---|---|
| Corn | 20,259 | 3,542.1 | 5 |
| Soybeans | 22,174 | 3,024.4 | 4 |
| Poultry and eggs | 4,337 | 1,357.6 | 12 |
| Hogs and pigs | 2,937 | 1,354.3 | 6 |
| Milk from cows | 1,290 | 708.4 | 14 |
| Cattle and calves | 13,529 | 510.5 | 29 |
| Wheat and all other grains, oilseeds, and dry beans | 3,961 | 159.2 | 18 |
| Vegetables, melons, potatoes, and sweet potatoes | 1,455 | 136.0 | 21 |
| Nursery, greenhouse, floriculture, and sod | 900 | 131.6 | 28 |
| Other crops and hay | 12,518 | 103.1 | 37 |
| Horses, ponies, mules, burros, and donkeys | 2,418 | 28.0 | 11 |
| Fruits, tree nuts, and berries | 846 | 16.0 | 35 |
| Sheep, goats, wool, mohair, and milk | 3,232 | 11.3 | 26 |
| Other animals and animal products | 1,428 | 9.8 | 32 |
| Aquaculture | 35 | 6.3 | 34 |
| Tobacco | 46 | 3.3 | 12 |
| Cut Christmas trees and short rotation woody crops | 151 | 2.9 | 17 |

Source: USDA, 2017 Census of Agriculture

**Figure 1: Value of Agricultural Production by State, 2017**




Source: USDA, 2017 Census of Agriculture

of agriculture production. By contrast, these commodities generated just 24 percent of U.S. farm sales.

After corn and soybeans, the production of poultry and eggs, along with hogs and pigs occupy the next tier of Indiana's agriculture output with sales of each commodity approaching $1.4 billion. Another highlight for Hoosier production in these industries is that the number of farms in the state engaged in these activities has been rising over the last five years. Compared to the 2012 Census of Agriculture, the number of farms in the state involved in poultry and egg production is up 10 percent to nearly 4,340 farms while the number of hog and pig producers has increased by 4 percent to approximately 2,940 farms.

An increase in production by Hoosier farmers between 2012 and 2017 (the last two Census of Agriculture years) has largely been the rule rather than the exception. As **Table 2** highlights, Indiana has seen a significant uptick in output in nearly all of its key commodities over the last five years. The largest increase belongs to corn grown for grain. Hoosier corn growers produced more than 980 million bushels in 2017, which represents a 64 percent increase over the drought-stricken 2012 output. To compare to a census year not affected by drought, the state's 2017 corn production was up 2 percent over the 2007 harvest.The state's farmers also registered strong increases in the production of eggs, soybeans and poultry. Among Indiana's key agriculture sectors, only production in cattle and calves has declined in the last five years.

**Table 2: Indiana Agricultural Production Volume for Select Commodities, 2012 and 2017**

| | Quantity, 2017 (1,000 units) | Quantity, 2012 (1,000 units) | Change, 2012-2017 |
|---|---|---|---|
| Corn for grain (bushels) | 980,333 | 597,271 | 64.1% |
| Corn for silage (tons) | 2,081 | 1,775 | 17.2% |
| Soybeans (bushels) | 319,049 | 218,928 | 45.7% |
| Hogs and pigs (head) | 11,315 | 10,551 | 7.2% |
| Poultry (head)* | 117,146 | 94,728 | 23.7% |
| Eggs (dozen eggs) | 150,264 | 102,603 | 46.5% |
| Milk from cows (1,000 lbs.) | 4,228 | 3,726 | 13.5% |
| Cattle and calves (head) | 621 | 665 | -6.6% |

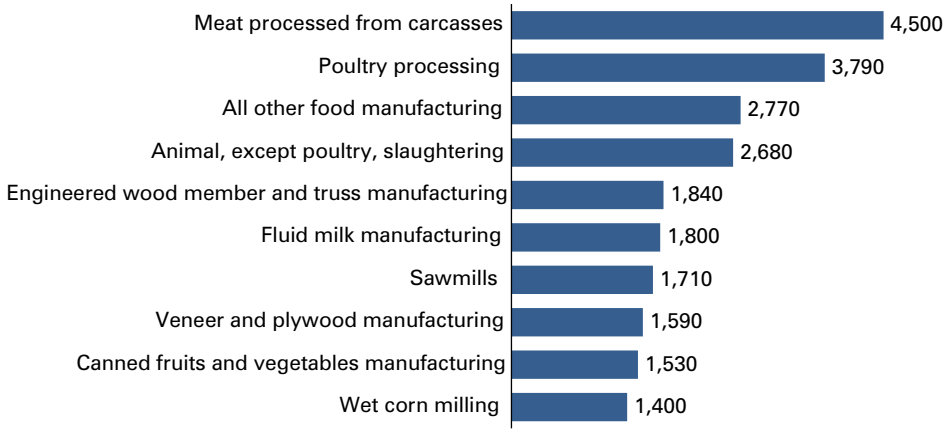
**Values comprise chickens, turkeys, ducks, pheasant, quail, geese and pigeons/squab only. Some poultry commodities are excluded due to data suppression.
Source: USDA, 2017 Census of Agriculture

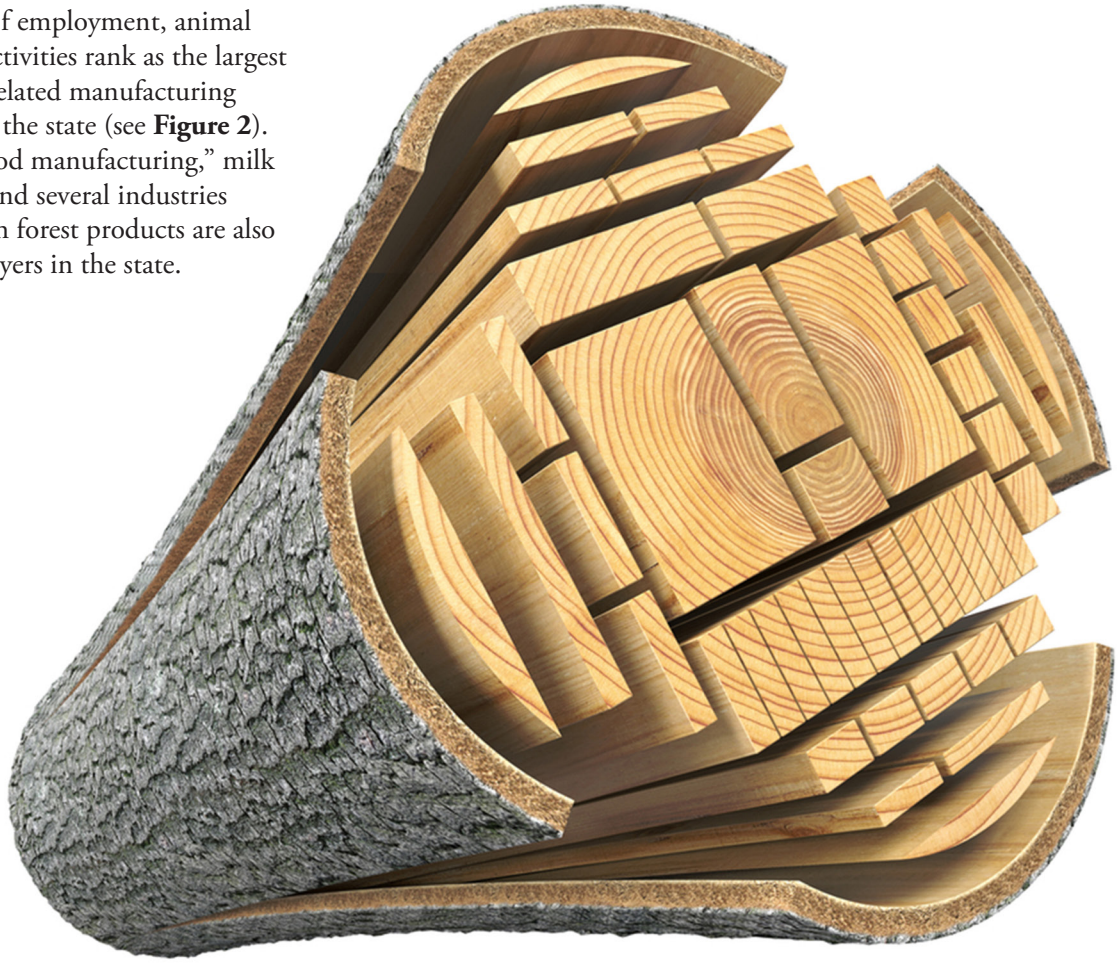
# Indiana's Agriculture Processing and Manufacturing Industries

Indiana's agriculture economy extends beyond the state's farms and forests to include a broad range of agriculture-related processing and manufacturing industries. These activities refer to industries that utilize agriculture commodities as the key inputs into their finished goods. All of these industries are classified under NAICS sectors 31 or 32. A few examples include fruit and vegetable canning, animal processing, ethanol production, and sawmills.

These industries combined to support an estimated 33,050 Hoosier jobs in 2017 and generate an estimated $23.2 billion in sales. From the perspective of employment, animal processing activities rank as the largest agriculture-related manufacturing industries in the state (see **Figure 2**). "All other food manufacturing," milk processing, and several industries involved with forest products are also major employers in the state.

**Figure 2: Direct Employment for Indiana's Top Agriculture-Related Processing and Manufacturing Industries, 2017**



# The Economic Impacts of Agriculture and Forestry

In the terminology of economic impact analysis, the commodity production and manufacturing activities highlighted previously describe the "direct effects" of agriculture's contribution to the Indiana economy. The economic contributions of agriculture do not end there, however, as supply chain purchases and the household spending of workers engaged in agriculture industries generate additional economic activity in the state. In order to estimate these knock-on effects, the Indiana Business Research Center (IBRC) research team used the IMPLAN economic modeling software to conduct an input-output analysis for Indiana agriculture.

The IMPLAN model draws from a variety of secondary data sources to provide a detailed account of the Indiana economy and describes how each agriculture industry interacts with other industries in the state. For instance, the IMPLAN model indicates 78 percent of the total value of sales for Indiana grain producers is dedicated to buying production inputs (i.e., fertilizers, pesticides, etc.), and that roughly 58 percent of these supply chain needs are met by other Hoosier businesses. The IMPLAN model also estimates how workers in the agriculture production and processing industries—as well as employees at supplier firms—spend their earnings on food, housing, health care, entertainment, etc. The combined impacts of these supply chain purchases and household spending are referred to as the economic "ripple effects" of

**Table 3: The Economic Contributions of Agriculture and Forestry to Indiana's Economy, 2017**

| | Direct Effects | Indirect Effects | Total | Multiplier |
|---|---|---|---|---|
| **Employment** | | | | |
| All Agriculture and Forestry | 108,105 | 91,965 | 200,070 | 1.85 |
| Production | 75,050 | 40,550 | 115,600 | 1.54 |
| Processing and Manufacturing | 33,055 | 51,415 | 84,470 | 2.56 |
| **Compensation ($ million)** | | | | |
| All Agriculture and Forestry | 5,294 | 5,195 | 10,489 | 1.98 |
| Production | 3,202 | 2,141 | 5,343 | 1.67 |
| Processing and Manufacturing | 2,092 | 3,054 | 5,146 | 2.46 |
| **Value Added ($million)** | | | | |
| All Agriculture and Forestry | 8,589 | 8,792 | 17,381 | 2.02 |
| Production | 4,540 | 4,051 | 8,591 | 1.89 |
| Processing and Manufacturing | 4,049 | 4,741 | 8,790 | 2.17 |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

agriculture activities in the following text and tables.

The research team made some adjustments to the IMPLAN model to eliminate any double counting of production that would occur when different agricultural industries buy production inputs from each other. Take the corn production and corn milling industries, for instance. Milling operations buy a portion of Indiana's corn production, which they use as an input to produce oils, sweeteners, starches, etc. If the IBRC did not adjust the model, then the value of the corn would be counted twice—once as the sale of raw corn and again as an input in the sale of the processed goods. These types of supply linkages are present throughout agriculture and forestry. These adjustments to the model eliminate any double counting within agriculture and ensure that the following estimates are as representative as possible.

## Summary of Economic Contributions

The headline finding in any impact analysis is usually the number of jobs created by the economic activity in question. As **Table 3** highlights, there were more than 108,000 jobs directly tied to agriculture in 2017. In addition to these direct effects, the supply chain purchases of the agriculture industries along with the household spending of agricultural workers combined to support nearly 92,000 additional "ripple effect" jobs in other industries. All told, agriculture's full employment footprint in the state stood at an estimated 200,070 jobs in 2017. This tally accounts for more than 5 percent of Indiana's total employment.

Another way to interpret these numbers is to look at the multiplier. The ratio of total employment effect to the direct jobs is 1.85, meaning that every job directly tied to agriculture supports an additional 0.85 jobs in the state (or every 100 agriculture jobs creates another 85 jobs statewide).

With 69 percent of the total, production activities accounted for the lion's share of direct agricultural employment in 2017. However—due to longer supply chains and higher pay—production and manufacturing activities support a greater number of

ripple effect jobs. At the end of the day, production activities are responsible for 58 percent of Indiana agriculture's total employment impact in the state, while processing industries support the remaining 42 percent.

Direct agriculture jobs generate nearly $5.3 billion in employee compensation in the state. With a nearly equal amount of compensation created by the ripple effect jobs, the combined effects of Indiana agriculture generated nearly $10.5 billion in total employee compensation in 2017.

Another key economic metric in assessing agriculture's contribution to the Hoosier economy is value added, which is another name for gross domestic product (GDP). Value added is simply a measure of the total economic output of a given industry (or states, nations, etc.) after subtracting the cost of production inputs. As the third section of **Table 3** shows, Indiana's agriculture-related establishments combined to generate an estimated $8.6 billion in direct value added in 2017. This level of activity triggered nearly $8.8 billion in ripple effects throughout the state to bring the industry's total GDP impact to $17.4 billion. As with the employment, this total value added impact accounts for roughly 5 percent of the state's total GDP in 2017. Meanwhile, the multiplier of 2.02 suggests that every dollar of direct value added associated with agriculture generates another dollar of GDP for other industries in the state.

## Economic Contributions by Industry

With Indiana ranking among the top six states in the production of corn, soybeans and hogs, it is no surprise that these three industries lead the way for the state's agricultural employment. In 2017, roughly 20 percent of Indiana's direct agriculture and forestry workers were engaged in hog production, while grain farming accounted for more than 17 percent of the total (see **Table 4**). Add in oilseed farming, and these three production industries combined to account for more than four out of every 10 direct agricultural workers in the state.

**Table 4: Agriculture and Forestry's Contribution to Indiana's Employment, Top 15 Industries, 2017**

| | Direct Effects | Ripple Effects* | Total | Multiplier |
|---|---|---|---|---|
| Corn, wheat, and other grain farming | 18,460 | 12,060 | 30,520 | 1.65 |
| Hog and pig production | 21,259 | 5,149 | 26,408 | 1.24 |
| Soybean and other oilseed farming | 7,550 | 10,210 | 17,760 | 2.35 |
| Animal (except poultry) slaughtering, rendering and processing | 7,440 | 7,810 | 15,250 | 2.05 |
| Support activities for agriculture and forestry | 7,670 | 3,980 | 11,650 | 1.52 |
| Wet corn milling | 1,400 | 8,490 | 9,890 | 7.06 |
| Cattle ranching and farming | 6,430 | 860 | 7,290 | 1.13 |
| Poultry and egg production | 3,000 | 3,840 | 6,840 | 2.28 |
| Poultry processing | 3,790 | 2,580 | 6,370 | 1.68 |
| All other food manufacturing | 2,770 | 2,870 | 5,640 | 2.04 |
| Soybean and other oilseed processing | 520 | 4,460 | 4,980 | 9.58 |
| Fluid milk and butter manufacturing | 1,800 | 3,180 | 4,980 | 2.77 |
| Dairy cattle and milk production | 2,310 | 2,130 | 4,440 | 1.92 |
| Sawmills and wood preservation | 1,850 | 2,140 | 3,990 | 2.16 |
| Fruit and vegetable canning, pickling, and drying | 1,530 | 2,220 | 3,750 | 2.45 |
| All other industries* | 20,326 | 19,986 | 40,312 | 1.98 |
| **Total** | **108,105** | **91,965** | **200,070** | **1.85** |

** Includes ethanol production. Please see Appendix Table 9 for complete detail.
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

The ripple effects of Indiana's grain production in 2017 supported an estimated 12,060 additional jobs around the state, while oilseed farming and hog production combined to generate nearly 15,400 additional jobs in other non-agriculture industries. In total, the combined effects of these three industries were responsible for approximately 74,700 jobs in 2017. Among other agriculture industries, animal (excluding poultry) processing

## Table 5: Agriculture and Forestry's Contribution to Indiana's Value Added, Top 15 Industries, 2017

| | Direct Effects ($ million) | Ripple Effects* ($ million) | Total ($ million) | Multiplier |
|---|---|---|---|---|
| Soybean and other oilseed farming | 1,399 | 995 | 2,394 | 1.71 |
| Corn, wheat, and other grain farming | 351 | 1,430 | 1,781 | 5.08 |
| Wet corn milling | 561 | 825 | 1,387 | 2.47 |
| Animal (except poultry) slaughtering, rendering and processing | 703 | 656 | 1,359 | 1.93 |
| Hog and pig production | 818 | 441 | 1,259 | 1.54 |
| Support activities for agriculture and forestry | 612 | 315 | 927 | 1.51 |
| Poultry and egg production | 265 | 381 | 647 | 2.44 |
| Soybean and other oilseed processing | 167 | 452 | 619 | 3.71 |
| Fluid milk and butter manufacturing | 256 | 283 | 539 | 2.10 |
| Dry, condensed, and evaporated dairy product manufacturing | 278 | 230 | 507 | 1.83 |
| All other food manufacturing | 231 | 254 | 485 | 2.10 |
| Dairy cattle and milk production | 268 | 209 | 477 | 1.78 |
| Poultry processing | 236 | 209 | 446 | 1.89 |
| Cattle ranching and farming | 321 | 80 | 401 | 1.25 |
| Ethanol production | 236 | 142 | 378 | 1.60 |
| All other industries* | 1,886 | 1,889 | 3,776 | 2.00 |
| **Total** | **8,589** | **8,792** | **17,381** | **2.02** |

** Please see Appendix Table 9 for complete detail.
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

had the next largest total employment impact (15,250 jobs) followed by agricultural support services (11,650), and wet corn milling (9,890).[1]

While a few production industries account for a large share of agriculture's total employment effect, the state's processing and manufacturing industries tend to have larger employment multipliers. Soybean and other oilseed processing, for instance, has an employment multiplier that approaches 10, while wet corn milling is not far behind with a multiplier of approximately 7. Taken as a group, Indiana's agricultural processing industries have an employment multiplier of 2.56 compared to 1.54 for farm production. Generally, a large employment multiplier indicates that an industry is input-intensive, meaning it engages a very long supply chain while producing its output with relatively few direct employees.

As with the employment impacts, oilseed and grain production rank as Indiana's top agriculture industries

1 See the appendix for a listing of total economic and employment contributions for each industry considered in this analysis.

for value added (see **Table 5**). The combined effects of oilseed farming totaled nearly $2.4 billion in GDP in 2017, while the full value added impact for grain production stood at roughly $1.8 billion. Other Indiana agriculture industries that can boast of total GDP impact in excess of $1 billion are wet corn milling ($1.4 billion in value added), animal (excluding (excluding poultry) processing ($1.4 billion) and hog production ($1.3 billion).

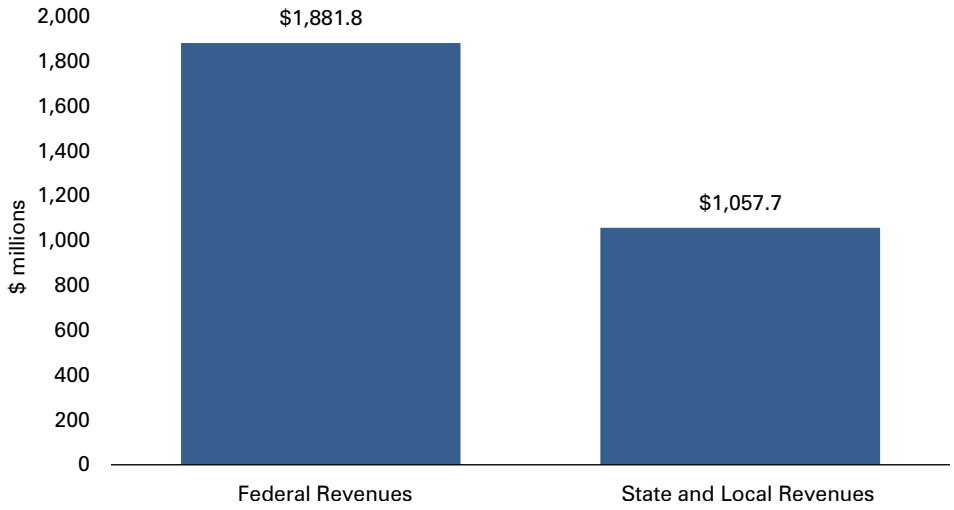
## Contributions to Government Revenues

The economic activity created by Indiana's agriculture and forestry industries also generates federal, state and local government revenues. The IMPLAN model estimates the tax revenues from corporate profits, indirect business taxes (e.g., sales, property and excise taxes), personal taxes (e.g., income and property taxes), and employer and employee contributions to social insurance. The largest share of federal revenue comes from contributions to social insurance through employee compensation. At the state and local level, indirect business taxes are the largest source of government revenue. As **Figure 3** shows, the economic activity related to Indiana agriculture and forestry generated approximately $1.1 billion in state and local revenue in 2017 and nearly $1.9 billion in federal collections.

## Agriculture's Impact in Indiana Regions

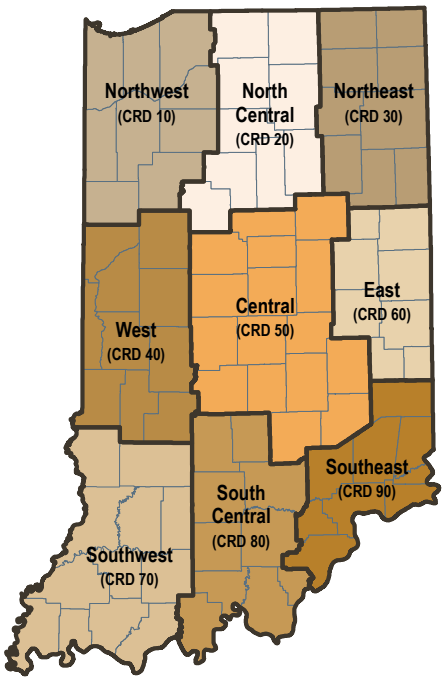
The broad range of Indiana's agricultural activities are evident when we look at economic impacts by region. Indiana's Central region (see **Figure 4** for reference) makes the largest contribution to the Indiana economy and is dominated by corn and soybean production, while in the North Central region, animal processing and hog production lead the way for the state's second most-productive crop district. Among other heavyweight regions, poultry processing is a key industry in Southwest Indiana and hog production headlines the employment impacts in the Northeast part of the state.

**Figure 3: Tax Effects of Indiana's Agriculture and Forestry, 2017 ($ million)**



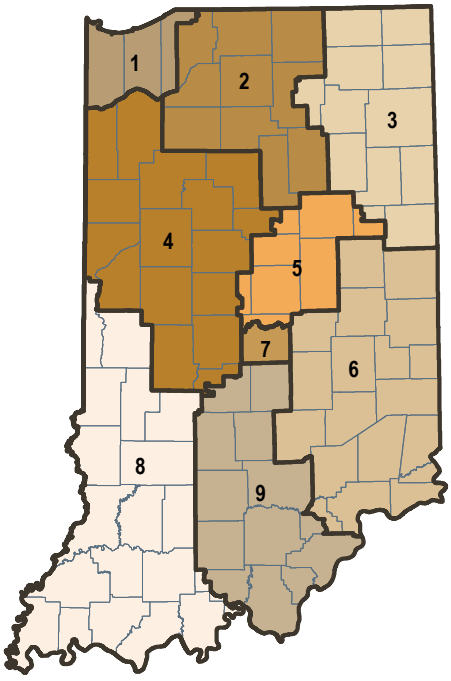

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

**Figure 4: Indiana's USDA Crop Reporting Districts**




Source: USDA

**Figure 5: Indiana Congressional Districts**




Source: Indiana Business Research Center

**Table 6: Value Added and Employment Effects by Crop Reporting District, 2017**

| | Value Added ($ million) | | | Employment | | |
|---|---|---|---|---|---|---|
| Region (CRD) | Direct Effects | Total Effects | Multiplier | Direct Effects | Total Effects | Multiplier |
| Northwest (10) | 854 | 1,481 | 1.73 | 8,870 | 16,720 | 1.89 |
| North Central (20) | 1,395 | 2,398 | 1.72 | 18,080 | 29,740 | 1.64 |
| Northeast (30) | 1,028 | 1,781 | 1.73 | 16,360 | 25,090 | 1.53 |
| West (40) | 856 | 1,377 | 1.61 | 9,055 | 15,440 | 1.71 |
| Central (50) | 1,892 | 4,286 | 2.27 | 19,150 | 41,770 | 2.18 |
| East (60) | 561 | 845 | 1.51 | 8,100 | 11,710 | 1.45 |
| Southwest (70) | 1,334 | 2,369 | 1.78 | 14,600 | 27,110 | 1.86 |
| South Central (80) | 398 | 591 | 1.49 | 7,770 | 10,390 | 1.34 |
| Southeast (90) | 271 | 407 | 1.50 | 5,510 | 7,220 | 1.31 |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

**Table 7: Value Added and Employment Effects by Congressional District, 2017**

| | Value Added ($ million) | | | Employment | | |
|---|---|---|---|---|---|---|
| Congressional District | Direct Effects | Total Effects | Multiplier | Direct Effects | Total Effects | Multiplier |
| 1st District | 287 | 501 | 1.75 | 2,630 | 5,190 | 1.97 |
| 2nd District | 998 | 1,723 | 1.73 | 14,720 | 22,890 | 1.56 |
| 3rd District | 1,267 | 2,134 | 1.68 | 19,320 | 29,290 | 1.52 |
| 4th District | 1,963 | 3,295 | 1.68 | 18,445 | 34,180 | 1.85 |
| 5th District | 672 | 1,220 | 1.82 | 5,920 | 10,950 | 1.85 |
| 6th District | 971 | 1,537 | 1.58 | 15,970 | 22,860 | 1.43 |
| 7th District | 349 | 705 | 2.02 | 1,810 | 4,820 | 2.66 |
| 8th District | 1,534 | 2,715 | 1.77 | 18,840 | 33,030 | 1.75 |
| 9th District | 547 | 909 | 1.66 | 10,810 | 15,340 | 1.42 |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

**Table 6** presents the value added and employment effects of agriculture in each USDA-defined crop reporting district. The Central region leads all areas in both categories, contributing nearly $4.3 billion in total GDP to the district and supporting an estimated 41,770 total jobs. Not only is the Central region a strong agricultural producer, but it's also the state's most populous and economically diverse area, which explains the large multiplier effects. The North Central and Southwest regions place second and third, respectively, in each measure. Together, these top three regions account for 52 percent of the value added that agriculture generates in Indiana, as well as 49 percent of the jobs.

For a more complete look at the impact of agriculture in each region, see the district-specific fact sheets beginning on page 13 of this report.

## Agriculture's Impact in Indiana Congressional Districts

Given the dramatically different characteristics of congressional districts in terms of land area and land use, there are wide disparities in the economic contributions of agriculture in Indiana's congressional districts. The combined effects of agriculture in the state's 4th District (see **Figure 5** for reference) produce nearly $3.3 billion in value added and support roughly 34,200 jobs. Both of these estimates rank at the top of Indiana's congressional districts (see **Table 7**). The 8th District provides the second-largest contribution to GDP and employment. As largely urban districts, the 1st and the 7th districts rank near the bottom in both categories, although the manufacturing-heavy nature of agricultural activities in the 7th District produces a large employment multiplier effect for that area.

The congressional district fact sheets, which begin on page 22, provide an in-depth look at the economic effects of agriculture in each area.

## Conclusion

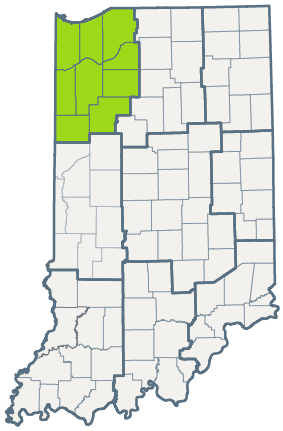
It is no secret that Indiana is an agricultural powerhouse. Findings from the latest USDA Census of Agriculture show that the state's $11.1 billion in commodity sales in 2017 ranks Indiana among the nation's top 10 producers. In key industries such as corn and soybean farming, as well as hog and pig production, Indiana ranks even higher, placing among the top six states nationally. Furthermore, Indiana's agriculture commodity production supports an estimated 75,100 direct jobs in the state. Add in the many Hoosier businesses engaged in closely

related agricultural processing and manufacturing activities, and Indiana's direct agricultural employment climbs to an estimated 108,100 jobs.

As this report demonstrates, however, the direct effects of Indiana's farm economy only partially describe agriculture's contribution to the Indiana economy. Once the economic ripple effects are added in, the combined effects of agriculture industries create a total of $17.4 billion in value added and support an estimated 200,070 jobs in the state. These numbers both amount to roughly 5 percent of Indiana's total GDP and employment.

These findings demonstrate that efforts to support and expand Indiana's agricultural production and processing will have positive ripple effects throughout the state's economy. This is especially true in regions of the state that are facing declines in other key industries. Therefore, the degree to which agriculture is able to contribute to Indiana's economic growth going forward will be an important economic indicator for the state.

# Crop Reporting District 10



In Indiana's Crop Reporting District 10, the full impact of agriculture-related activities in 2017 stands at an estimated $4.5 billion in sales (i.e., economic output), $1.5 billion in GDP and 16,720 jobs.

With respect to the employment impact, there were an estimated 8,870 jobs directly supported by agriculture-related establishments. Approximately 71 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 29 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 7,850 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.89, meaning that every direct job in agriculture supports approximately 0.89 jobs in other industries in the region (or every 100 direct jobs create an additional 89 jobs). Likewise, the GDP multiplier of 1.73 suggests that every dollar of GDP directly related to agriculture in District 10 generates an additional $0.73 in economic activity elsewhere in the district.

Among individual agricultural industries, corn, wheat, and other grain farming supported the greatest number of jobs in District 10 at an estimated 3,600 in 2017, which accounted for roughly 22 percent of agriculture's total employment impact in the district. Hog and pig production was the district's second-largest job producer with a total impact of 1,648 jobs. Soybean and other oilseed farming generated the largest contribution to GDP in District 10 with an estimated total value added impact of $235 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's 10th Crop Reporting District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 8,870 | 7,850 | 16,720 | 1.89 |
| Production | 6,330 | 4,460 | 10,790 | 1.70 |
| Processing and Manufacturing | 2,540 | 3,390 | 5,930 | 2.33 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 558 | 351 | 909 | 1.63 |
| Production | 410 | 189 | 599 | 1.46 |
| Processing and Manufacturing | 154 | 170 | 324 | 2.10 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 854 | 627 | 1,481 | 1.73 |
| Production | 536 | 355 | 892 | 1.66 |
| Processing and Manufacturing | 317 | 272 | 589 | 1.86 |

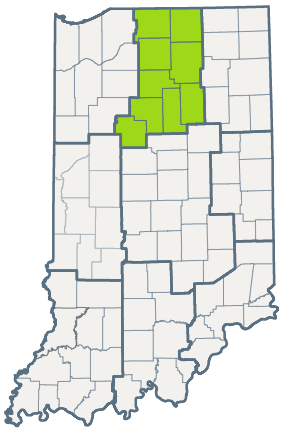
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the 10th Crop Reporting District 2017, Top 5 Industries

| Industry | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Corn, wheat , and other grain farming | 2,050 | 1,550 | 3,600 | 1.76 | 59 | 135 | 193 | 3.30 |
| Hog and pig production | 1,199 | 448 | 1,648 | 1.37 | 77 | 32 | 110 | 1.42 |
| Soybean and other oilseed farming | 550 | 950 | 1,500 | 2.73 | 161 | 74 | 235 | 1.46 |
| Support activities for agriculture and forestry | 840 | 400 | 1,240 | 1.48 | 67 | 27 | 94 | 1.41 |
| Dairy cattle and milk production | 570 | 600 | 1,170 | 2.05 | 80 | 47 | 127 | 1.59 |
| **All Other Industries** | **3,661** | **3,902** | **7,562** | **2.07** | **410** | **312** | **722** | **1.76** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Crop Reporting District 20



In Indiana's Crop Reporting District 20, the full impact of agriculture-related activities in 2017 stands at an estimated $8.4 billion in sales (i.e., economic output), $2.4 billion in GDP and 29,740 jobs.

With respect to the employment impact, there were an estimated 18,080 jobs directly supported by agriculture-related establishments. Approximately 60 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 40 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 11,660 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.64, meaning that every direct job in agriculture supports approximately 0.64 jobs in other industries in the region (or every 100 direct jobs create an additional 64 jobs). Likewise, the GDP multiplier of 1.72 suggests that every dollar of GDP directly related to agriculture in District 20 generates an additional $0.72 in economic activity elsewhere in the district.

Among individual agricultural industries, animal (except poultry) slaughtering, rendering and processing supported the greatest number of jobs in District 20 at an estimated 8,040 in 2017, which accounted for roughly 33 percent of agriculture's total employment impact in the district. Hog and pig production was the district's second-largest job producer with a total impact of 5,279 jobs. Animal slaughtering, rendering and processing generated the largest contribution to GDP in District 20 with an estimated total value added impact of $735 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's 20th Crop Reporting District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 18,080 | 11,660 | 29,740 | 1.64 |
| Production | 10,820 | 4,640 | 15,460 | 1.43 |
| Processing and Manufacturing | 7,260 | 7,020 | 14,280 | 1.97 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 808 | 596 | 1,404 | 1.74 |
| Production | 442 | 220 | 662 | 1.50 |
| Processing and Manufacturing | 396 | 425 | 821 | 2.07 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 1,395 | 1,003 | 2,398 | 1.72 |
| Production | 672 | 397 | 1,069 | 1.59 |
| Processing and Manufacturing | 723 | 606 | 1,329 | 1.84 |

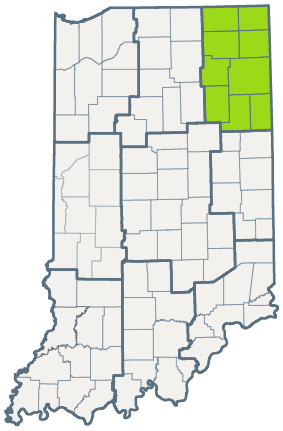
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the 20th Crop Reporting District 2017, Top 5 Industries

| Industry | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Animal (except poultry) slaughtering, rendering and processing | 4,360 | 3,680 | 8,040 | 1.84 | 441 | 294 | 735 | 1.67 |
| Hog and pig production | 4,152 | 1,127 | 5,279 | 1.27 | 210 | 86 | 296 | 1.41 |
| Corn, wheat , and other grain farming | 2,250 | 1,220 | 3,470 | 1.54 | 49 | 116 | 165 | 3.37 |
| Soybean and other oilseed farming | 690 | 870 | 1,560 | 2.26 | 158 | 71 | 230 | 1.45 |
| Support activities for agriculture and forestry | 1,010 | 260 | 1,270 | 1.26 | 48 | 18 | 66 | 1.38 |
| **All Other Industries** | **5,618** | **4,503** | **10,121** | **1.80** | **489** | **418** | **906** | **1.85** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Crop Reporting District 30



In Indiana's Crop Reporting District 30, the full impact of agriculture-related activities in 2017 stands at an estimated $5.3 billion in sales (i.e., economic output), $1.8 billion in GDP and 25,090 jobs.

With respect to the employment impact, there were an estimated 16,360 jobs directly supported by agriculture-related establishments. Approximately 80 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 20 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 8,730 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.53, meaning that every direct job in agriculture supports approximately 0.53 jobs in other industries in the region (or every 100 direct jobs create an additional 53 jobs). Likewise, the GDP multiplier of 1.73 suggests that every dollar of GDP directly related to agriculture in District 30 generates an additional $0.73 in economic activity elsewhere in the district.

Among individual agricultural industries, hog and pig production supported the greatest number of jobs in District 30 at an estimated 5,431 in 2017, which accounted for roughly 22 percent of agriculture's total employment impact in the district. Corn, wheat and other grain farming was the district's second-largest job producer with a total impact of 3,320 jobs. Soybean and other oilseed farming generated the largest contribution to GDP in District 30 with an estimated total value added impact of $250 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's 30th Crop Reporting District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 16,360 | 8,730 | 25,090 | 1.53 |
| Production | 13,080 | 4,320 | 17,400 | 1.33 |
| Processing and Manufacturing | 3,280 | 4,410 | 7,690 | 2.34 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 540 | 423 | 963 | 1.78 |
| Production | 368 | 197 | 566 | 1.54 |
| Processing and Manufacturing | 184 | 246 | 430 | 2.33 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 1,028 | 753 | 1,781 | 1.73 |
| Production | 649 | 366 | 1,015 | 1.56 |
| Processing and Manufacturing | 379 | 388 | 767 | 2.02 |

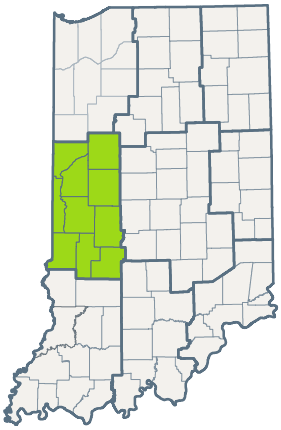
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the 30th Crop Reporting District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Hog and pig production | 4,698 | 733 | 5,431 | 1.16 | 138 | 56 | 195 | 1.41 |
| Corn, wheat , and other grain farming | 2,310 | 1,010 | 3,320 | 1.44 | 36 | 98 | 133 | 3.76 |
| Cattle ranching and farming | 2,060 | 230 | 2,290 | 1.11 | 97 | 18 | 116 | 1.19 |
| Soybean and other oilseed farming | 1,050 | 990 | 2,040 | 1.94 | 167 | 83 | 250 | 1.50 |
| Soybean and other oilseed processing | 150 | 1,160 | 1,310 | 8.73 | 48 | 112 | 160 | 3.32 |
| **All Other Industries** | **6,092** | **4,607** | **10,699** | **1.76** | **542** | **386** | **928** | **1.71** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Crop Reporting District 40



In Indiana's Crop Reporting District 40, the full impact of agriculture-related activities in 2017 stands at an estimated $4.4 billion in sales (i.e., economic output), $1.4 billion in GDP and 15,440 jobs.

With respect to the employment impact, there were an estimated 9,055 jobs directly supported by agriculture-related establishments. Approximately 75 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 25 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 6,385 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.71, meaning that every direct job in agriculture supports approximately 0.71 jobs in other industries in the region (or every 100 direct jobs create an additional 71 jobs). Likewise, the GDP multiplier of 1.61 suggests that every dollar of GDP directly related to agriculture in District 40 generates an additional $0.61 in economic activity elsewhere in the district.

Among individual agricultural industries, corn, wheat and other grain farming supported the greatest number of jobs in District 40 at an estimated 3,660 in 2017, which accounted for roughly 24 percent of agriculture's total employment impact in the district. Soybean and other oilseed farming was the district's second-largest job producer with a total impact of 2,240 jobs. Wet corn milling generated the largest contribution to GDP in District 40 with an estimated total value added impact of $337 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's 40th Crop Reporting District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 9,055 | 6,385 | 15,440 | 1.71 |
| Production | 6,790 | 2,960 | 9,750 | 1.44 |
| Processing and Manufacturing | 2,265 | 3,425 | 5,690 | 2.51 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 510 | 277 | 787 | 1.54 |
| Production | 330 | 121 | 451 | 1.37 |
| Processing and Manufacturing | 210 | 180 | 390 | 1.85 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 856 | 521 | 1,377 | 1.61 |
| Production | 395 | 247 | 641 | 1.62 |
| Processing and Manufacturing | 461 | 275 | 736 | 1.60 |

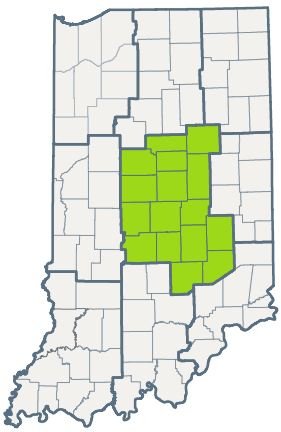
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the 40th Crop Reporting District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Corn, wheat , and other grain farming | 2,650 | 1,010 | 3,660 | 1.38 | 43 | 99 | 141 | 3.31 |
| Soybean and other oilseed farming | 1,120 | 1,120 | 2,240 | 2.00 | 174 | 87 | 261 | 1.50 |
| Wet corn milling | 450 | 1,650 | 2,100 | 4.67 | 199 | 138 | 337 | 1.69 |
| Hog and pig production | 1,097 | 178 | 1,275 | 1.16 | 30 | 13 | 43 | 1.42 |
| Cheese manufacturing | 440 | 640 | 1,080 | 2.45 | 95 | 49 | 144 | 1.51 |
| **All Other Industries** | **3,298** | **1,787** | **5,085** | **1.54** | **314** | **136** | **450** | **1.43** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Crop Reporting District 50



In Indiana's Crop Reporting District 50, the full impact of agriculture-related activities in 2017 stands at an estimated $11.5 billion in sales (i.e., economic output), $4.3 billion in GDP and 41,770 jobs.

With respect to the employment impact, there were an estimated 19,150 jobs directly supported by agriculture-related establishments. Approximately 60 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 40 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 22,620jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 2.18, meaning that every direct job in agriculture supports approximately 1.18 jobs in other industries in the region (or every 100 direct jobs create an additional 118 jobs). Likewise, the GDP multiplier of 2.27 suggests that every dollar of GDP directly related to agriculture in District 50 generates an additional $1.27 in economic activity elsewhere in the district.

Among individual agricultural industries, corn, wheat and other grain farming supported the greatest number of jobs in District 50 at an estimated 6,010 in 2017, which accounted for roughly 14 percent of agriculture's total employment impact in the district. Soybean and other oilseed farming was the district's second-largest job producer with a total impact of 3,850 jobs. Soybean and other oilseed farming generated the largest contribution to GDP in District 50 with an estimated total value added impact of $566 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's 50th Crop Reporting District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 19,150 | 22,620 | 41,770 | 2.18 |
| Production | 11,420 | 8,300 | 19,720 | 1.73 |
| Processing and Manufacturing | 7,730 | 14,320 | 22,050 | 2.85 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 1,240 | 1,407 | 2,647 | 2.13 |
| Production | 756 | 506 | 1,262 | 1.67 |
| Processing and Manufacturing | 495 | 932 | 1,427 | 2.88 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 1,892 | 2,394 | 4,286 | 2.27 |
| Production | 935 | 920 | 1,855 | 1.98 |
| Processing and Manufacturing | 958 | 1,474 | 2,432 | 2.54 |

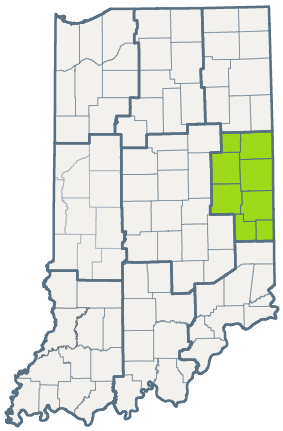
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the 50th Crop Reporting District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Corn, wheat , and other grain farming | 3,440 | 2,570 | 6,010 | 1.75 | 70 | 348 | 417 | 6.00 |
| Soybean and other oilseed farming | 1,480 | 2,370 | 3,850 | 2.60 | 305 | 261 | 566 | 1.86 |
| Hog and pig production | 2,868 | 843 | 3,711 | 1.29 | 139 | 81 | 220 | 1.58 |
| Wet corn milling | 430 | 2,950 | 3,380 | 7.86 | 193 | 309 | 502 | 2.60 |
| Support activities for agriculture and forestry | 1,650 | 1,630 | 3,280 | 1.99 | 272 | 143 | 416 | 1.53 |
| **All Other Industries** | **9,282** | **12,257** | **21,539** | **2.32** | **913** | **1,252** | **2,165** | **2.37** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Crop Reporting District 60



In Indiana's Crop Reporting District 60, the full impact of agriculture-related activities in 2017 stands at an estimated $2.6 billion in sales (i.e., economic output), $0.8 billion in GDP and 11,710 jobs.

With respect to the employment impact, there were an estimated 8,100 jobs directly supported by agriculture-related establishments. Approximately 83 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 17 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 3,610 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.45, meaning that every direct job in agriculture supports approximately 0.45 jobs in other industries in the region (or every 100 direct jobs create an additional 45 jobs). Likewise, the GDP multiplier of 1.51 suggests that every dollar of GDP directly related to agriculture in District 60 generates an additional $0.51 in economic activity elsewhere in the district.

Among individual agricultural industries, hog and pig production supported the greatest number of jobs in District 60 at an estimated 3,371 in 2017, which accounted for roughly 29 percent of agriculture's total employment impact in the district. Corn, wheat and other grain farming was the district's second-largest job producer with a total impact of 1,880 jobs. Hog and pig production generated the largest contribution to GDP in District 60 with an estimated total value added impact of $176 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's 60th Crop Reporting District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 8,100 | 3,610 | 11,710 | 1.45 |
| Production | 6,710 | 2,440 | 9,150 | 1.36 |
| Processing and Manufacturing | 1,390 | 1,170 | 2,560 | 1.84 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 320 | 153 | 473 | 1.48 |
| Production | 254 | 102 | 356 | 1.40 |
| Processing and Manufacturing | 94 | 72 | 166 | 1.76 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 561 | 284 | 845 | 1.51 |
| Production | 414 | 187 | 601 | 1.45 |
| Processing and Manufacturing | 146 | 98 | 244 | 1.67 |

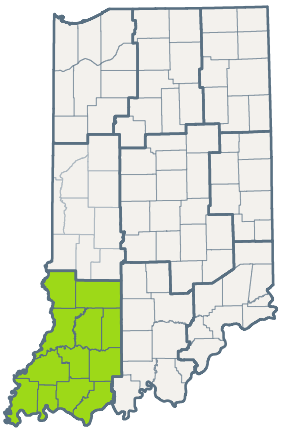
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the 60th Crop Reporting District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Hog and pig production | 2,772 | 600 | 3,371 | 1.22 | 133 | 43 | 176 | 1.32 |
| Corn, wheat , and other grain farming | 1,340 | 540 | 1,880 | 1.40 | 26 | 45 | 71 | 2.75 |
| Soybean and other oilseed farming | 610 | 570 | 1,180 | 1.93 | 125 | 43 | 168 | 1.34 |
| Support activities for agriculture and forestry | 840 | 160 | 1,000 | 1.19 | 29 | 11 | 40 | 1.38 |
| Poultry and egg production | 230 | 350 | 580 | 2.52 | 35 | 29 | 64 | 1.82 |
| **All Other Industries** | **2,308** | **1,390** | **3,699** | **1.60** | **212** | **114** | **326** | **1.54** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Crop Reporting District 70



In Indiana's Crop Reporting District 70, the full impact of agriculture-related activities in 2017 stands at an estimated $8.1 billion in sales (i.e., economic output), $2.4 billion in GDP and 27,110 jobs.

With respect to the employment impact, there were an estimated 14,600 jobs directly supported by agriculture-related establishments. Approximately 63 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 37 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 12,510 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.86, meaning that every direct job in agriculture supports approximately 0.86 jobs in other industries in the region (or every 100 direct jobs create an additional 86 jobs). Likewise, the GDP multiplier of 1.78 suggests that every dollar of GDP directly related to agriculture in District 70 generates an additional $0.78 in economic activity elsewhere in the district.

Among individual agricultural industries, corn, wheat and pig production supported the greatest number of jobs in District 70 at an estimated 4,000 in 2017, which accounted for roughly 15 percent of agriculture's total employment impact in the district. Poultry processing was the district's second-largest job producer with a total impact of 2,540 jobs. Dry, condensed and evaporated dairy product manufacturing generated the largest contribution to GDP in District 70 with an estimated total value added impact of $394 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's 70th Crop Reporting District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 14,600 | 12,510 | 27,110 | 1.86 |
| Production | 9,130 | 4,620 | 13,750 | 1.51 |
| Processing and Manufacturing | 5,470 | 7,890 | 13,360 | 2.44 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 849 | 589 | 1,438 | 1.69 |
| Production | 472 | 205 | 677 | 1.43 |
| Processing and Manufacturing | 398 | 416 | 814 | 2.05 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 1,334 | 1,035 | 2,369 | 1.78 |
| Production | 519 | 389 | 909 | 1.75 |
| Processing and Manufacturing | 815 | 645 | 1,460 | 1.79 |

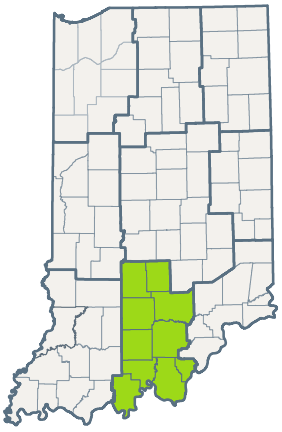
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the 70th Crop Reporting District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Corn, wheat , and other grain farming | 2,680 | 1,320 | 4,000 | 1.49 | 48 | 127 | 175 | 3.66 |
| Poultry processing | 1,650 | 890 | 2,540 | 1.54 | 98 | 64 | 163 | 1.65 |
| Soybean and other oilseed farming | 1,010 | 1,340 | 2,350 | 2.33 | 183 | 106 | 289 | 1.58 |
| Dry, condensed, and evaporated dairy product manufacturing | 660 | 1,690 | 2,350 | 3.56 | 257 | 137 | 394 | 1.53 |
| Hog and pig production | 1,900 | 361 | 2,261 | 1.19 | 59 | 26 | 85 | 1.45 |
| **All Other Industries** | **6,700** | **6,909** | **13,609** | **2.03** | **689** | **575** | **1,264** | **1.83** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Crop Reporting District 80



In Indiana's Crop Reporting District 80, the full impact of agriculture-related activities in 2017 stands at an estimated $1.7 billion in sales (i.e., economic output), $0.6 billion in GDP and 10,390 jobs.

With respect to the employment impact, there were an estimated 7,770 jobs directly supported by agriculture-related establishments. Approximately 76 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 24 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 2,620 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.34, meaning that every direct job in agriculture supports approximately 0.34 jobs in other industries in the region (or every 100 direct jobs create an additional 34 jobs). Likewise, the GDP multiplier of 1.49 suggests that every dollar of GDP directly related to agriculture in District 80 generates an additional $0.49 in economic activity elsewhere in the district.

Among individual agricultural industries, corn, wheat and other grain farming supported the greatest number of jobs in District 80 at an estimated 1,430 in 2017, which accounted for roughly 14 percent of agriculture's total employment impact in the district. Poultry and egg production was the district's second-largest job producer with a total impact of 1,280 jobs. Poultry and egg production generated the largest contribution to GDP in District 80 with an estimated total value added impact of $90 million.

### The Economic Contributions of Agriculture and Forestry to Indiana's 80th Crop Reporting District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 7,770 | 2,620 | 10,390 | 1.34 |
| Production | 5,910 | 1,390 | 7,300 | 1.24 |
| Processing and Manufacturing | 1,860 | 1,230 | 3,090 | 1.66 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 247 | 106 | 353 | 1.43 |
| Production | 146 | 54 | 200 | 1.37 |
| Processing and Manufacturing | 101 | 52 | 153 | 1.51 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 398 | 193 | 591 | 1.49 |
| Production | 264 | 105 | 369 | 1.40 |
| Processing and Manufacturing | 134 | 88 | 222 | 1.66 |

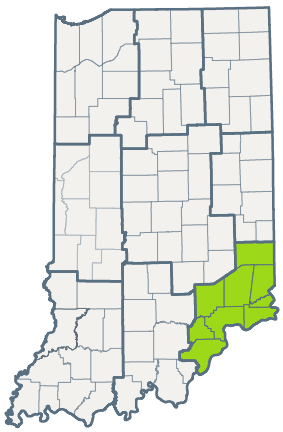
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

### Agriculture and Forestry's Economic Contribution in the 80th Crop Reporting District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Corn, wheat , and other grain farming | 1,150 | 280 | 1,430 | 1.24 | 12 | 25 | 37 | 3.04 |
| Poultry and egg production | 840 | 440 | 1,280 | 1.52 | 57 | 33 | 90 | 1.58 |
| Hog and pig production | 963 | 73 | 1,036 | 1.08 | 18 | 5 | 23 | 1.26 |
| Soybean and other oilseed farming | 590 | 320 | 910 | 1.54 | 64 | 24 | 88 | 1.38 |
| Cattle ranching and farming | 820 | 30 | 850 | 1.04 | 24 | 2 | 27 | 1.10 |
| **All Other Industries** | **3,407** | **1,477** | **4,884** | **1.43** | **222** | **104** | **326** | **1.47** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Crop Reporting District 90



In Indiana's Crop Reporting District 90, the full impact of agriculture-related activities in 2017 stands at an estimated $1.2 billion in sales (i.e., economic output), $0.4 billion in GDP and 7,220 jobs.

With respect to the employment impact, there were an estimated 5,510 jobs directly supported by agriculture-related establishments. Approximately 77 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 23 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 1,710 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.31, meaning that every direct job in agriculture supports approximately 0.31 jobs in other industries in the region (or every 100 direct jobs create an additional 31 jobs). Likewise, the GDP multiplier of 1.50 suggests that every dollar of GDP directly related to agriculture in District 90 generates an additional $0.50 in economic activity elsewhere in the district.

Among individual agricultural industries, corn, wheat and other grain farming supported the greatest number of jobs in District 90 at an estimated 1,190 in 2017, which accounted for roughly 16 percent of agriculture's total employment impact in the district. Soybean and other oilseed farming was the district's second-largest job producer with a total impact of 820 jobs. Soybean and other oilseed farming generated the largest contribution to GDP in District 90 with an estimated total value added impact of $78 million.

### The Economic Contributions of Agriculture and Forestry to Indiana's 90th Crop Reporting District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 5,510 | 1,710 | 7,220 | 1.31 |
| Production | 4,260 | 620 | 4,880 | 1.15 |
| Processing and Manufacturing | 1,250 | 1,090 | 2,340 | 1.87 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 128 | 77 | 206 | 1.60 |
| Production | 56 | 27 | 82 | 1.48 |
| Processing and Manufacturing | 73 | 51 | 123 | 1.70 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 271 | 136 | 407 | 1.50 |
| Production | 155 | 52 | 208 | 1.34 |
| Processing and Manufacturing | 115 | 84 | 199 | 1.73 |

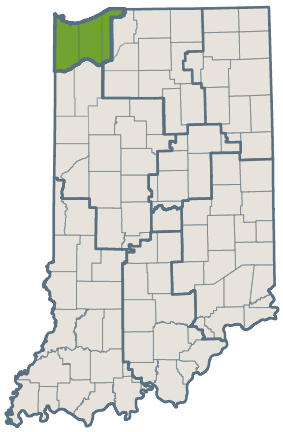
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

### Agriculture and Forestry's Economic Contribution in the 90th Crop Reporting District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Corn, wheat , and other grain farming | 1,000 | 190 | 1,190 | 1.19 | 10 | 18 | 27 | 2.86 |
| Soybean and other oilseed farming | 600 | 220 | 820 | 1.37 | 60 | 18 | 78 | 1.29 |
| Hog and pig production | 627 | 28 | 654 | 1.04 | 12 | 2 | 14 | 1.19 |
| Canned specialties | 300 | 320 | 620 | 2.07 | 46 | 25 | 71 | 1.54 |
| Cattle ranching and farming | 570 | 20 | 590 | 1.04 | 18 | 2 | 19 | 1.10 |
| **All Other Industries** | **2,413** | **932** | **3,346** | **1.39** | **125** | **71** | **197** | **1.57** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Congressional District 1



In Indiana's 1st Congressional District, the full impact of agriculture-related activities in 2017 stands at an estimated $1.6 billion in sales (i.e., economic output), $0.5 billion in GDP and 5,190 jobs.

With respect to the employment impact, there were an estimated 2,630 jobs directly supported by agriculture-related establishments. Approximately 40 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 60 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 2,560 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.97, meaning that every direct job in agriculture supports approximately 0.97 jobs in other industries in the region (or every 100 direct jobs create an additional 97 jobs). Likewise, the GDP multiplier of 1.75 suggests that every dollar of GDP directly related to agriculture in the 1st District generates an additional $0.75 in economic activity elsewhere in the district.

Among individual agricultural industries, wet corn milling supported the greatest number of jobs in the 1st District at an estimated 1,030 in 2017, which accounted for roughly 20 percent of agriculture's total employment impact in the district. Dehydrated food products manufacturing was the district's second-largest job producer with a total impact of 950 jobs. Wet corn milling generated the largest contribution to GDP in the 1st District with an estimated total value added impact of $143 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's First Congressional District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 2,630 | 2,560 | 5,190 | 1.97 |
| Production | 1,060 | 420 | 1,480 | 1.40 |
| Processing and Manufacturing | 1,570 | 2,140 | 3,710 | 2.36 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 113 | 126 | 239 | 2.11 |
| Production | 20 | 19 | 39 | 1.95 |
| Processing and Manufacturing | 93 | 107 | 200 | 2.15 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 287 | 215 | 501 | 1.75 |
| Production | 78 | 37 | 114 | 1.47 |
| Processing and Manufacturing | 209 | 178 | 387 | 1.85 |

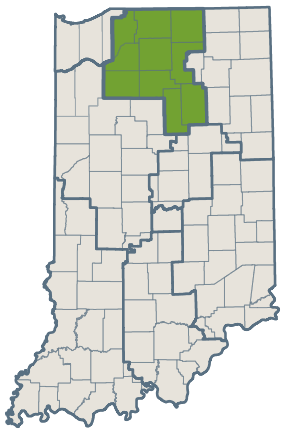
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the First Congressional District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Wet corn milling | 180 | 850 | 1,030 | 5.72 | 69 | 74 | 143 | 2.08 |
| Dehydrated food products manufacturing | 500 | 450 | 950 | 1.90 | 39 | 36 | 75 | 1.92 |
| Nonchocolate confectionery manufacturing | 420 | 430 | 850 | 2.02 | 65 | 35 | 100 | 1.55 |
| Corn, wheat , and other grain farming | 430 | 210 | 640 | 1.49 | 10 | 19 | 28 | 2.95 |
| Animal (except poultry) slaughtering, rendering and processing | 250 | 210 | 460 | 1.84 | 22 | 16 | 38 | 1.72 |
| **All Other Industries** | **850** | **410** | **1,260** | **1.48** | **83** | **35** | **118** | **1.42** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Congressional District 2



In Indiana's 2nd Congressional District, the full impact of agriculture-related activities in 2017 stands at an estimated $5.5 billion in sales (i.e., economic output), $1.7 billion in GDP and 22,890 jobs.

With respect to the employment impact, there were an estimated 14,720 jobs directly supported by agriculture-related establishments. Approximately 71 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 29 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 8,170 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.56, meaning that every direct job in agriculture supports approximately 0.56 jobs in other industries in the region (or every 100 direct jobs create an additional 56 jobs). Likewise, the GDP multiplier of 1.73 suggests that every dollar of GDP directly related to agriculture in the 2nd District generates an additional $0.73 in economic activity elsewhere in the district.

Among individual agricultural industries, hog and pig production supported the greatest number of jobs in the 2nd District at an estimated 3,832 in 2017, which accounted for roughly 17 percent of agriculture's total employment impact in the district. Corn, wheat and other grain farming was the district's second-largest job producer with a total impact of 3,610 jobs. Animal (except poultry) slaughtering, rendering and processing generated the largest contribution to GDP in the 2nd District with an estimated total value added impact of $227 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's Second Congressional District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 14,720 | 8,170 | 22,890 | 1.56 |
| Production | 10,400 | 4,100 | 14,500 | 1.39 |
| Processing and Manufacturing | 4,320 | 4,070 | 8,390 | 1.94 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 611 | 417 | 1,028 | 1.68 |
| Production | 390 | 195 | 585 | 1.50 |
| Processing and Manufacturing | 239 | 255 | 494 | 2.07 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 998 | 725 | 1,723 | 1.73 |
| Production | 609 | 356 | 965 | 1.58 |
| Processing and Manufacturing | 389 | 369 | 758 | 1.95 |

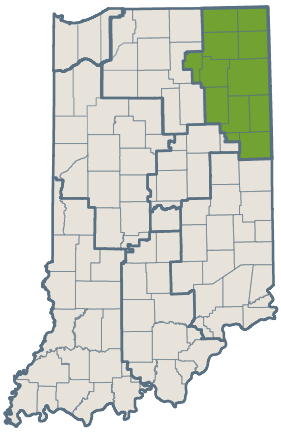
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the Second Congressional District 2017, Top 5 Industries

| Industry | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Hog and pig production | 3,203 | 629 | 3,832 | 1.2 | 138 | 49 | 187 | 1.35 |
| Corn, wheat , and other grain farming | 2,390 | 1,220 | 3,610 | 1.51 | 48 | 118 | 166 | 3.44 |
| Animal (except poultry) slaughtering, rendering and processing | 1,580 | 1,100 | 2,680 | 1.70 | 133 | 95 | 227 | 1.71 |
| Soybean and other oilseed farming | 720 | 840 | 1,560 | 2.17 | 154 | 71 | 225 | 1.46 |
| Support activities for agriculture and forestry | 1,100 | 290 | 1,390 | 1.26 | 52 | 21 | 73 | 1.39 |
| **All Other Industries** | **5,727** | **4,091** | **9,818** | **1.71** | **472** | **372** | **844** | **1.79** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Congressional District 3



In Indiana's 3rd Congressional District, the full impact of agriculture-related activities in 2017 stands at an estimated $6.4 billion in sales (i.e., economic output), $2.1 billion in GDP and 29,290 jobs.

With respect to the employment impact, there were an estimated 19,320 jobs directly supported by agriculture-related establishments. Approximately 79 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 21 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 9,970 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.52, meaning that every direct job in agriculture supports approximately 0.52 jobs in other industries in the region (or every 100 direct jobs create an additional 52 jobs). Likewise, the GDP multiplier of 1.68 suggests that every dollar of GDP directly related to agriculture in the 3rd District generates an additional $0.68 in economic activity elsewhere in the district.

Among individual agricultural industries, hog and pig production supported the greatest number of jobs in the 3rd District at an estimated 6,927 in 2017, which accounted for roughly 24 percent of agriculture's total employment impact in the district. Corn, wheat and other grain farming was the district's second-largest job producer with a total impact of 3,400 jobs. Soybean and other oilseed farming generated the largest contribution to GDP in the 3rd District with an estimated total value added impact of $316 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's Third Congressional District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 19,320 | 9,970 | 29,290 | 1.52 |
| Production | 15,290 | 5,220 | 20,510 | 1.34 |
| Processing and Manufacturing | 4,030 | 4,750 | 8,780 | 2.18 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 715 | 488 | 1,202 | 1.68 |
| Production | 510 | 241 | 751 | 1.47 |
| Processing and Manufacturing | 228 | 278 | 506 | 2.22 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 1,267 | 867 | 2,134 | 1.68 |
| Production | 827 | 437 | 1,264 | 1.53 |
| Processing and Manufacturing | 440 | 430 | 870 | 1.98 |

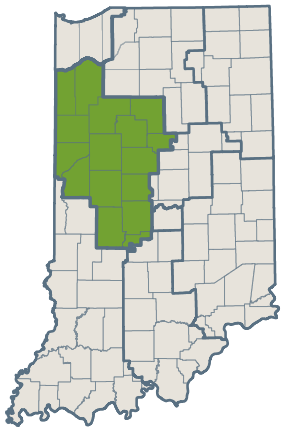
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the Third Congressional District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Hog and pig production | 5,925 | 1,002 | 6,927 | 1.17 | 197 | 77 | 274 | 1.39 |
| Corn, wheat , and other grain farming | 2,360 | 1,040 | 3,400 | 1.44 | 40 | 99 | 139 | 3.50 |
| Soybean and other oilseed farming | 1,220 | 1,230 | 2,450 | 2.01 | 215 | 102 | 316 | 1.47 |
| Cattle ranching and farming | 2,170 | 240 | 2,410 | 1.11 | 109 | 20 | 129 | 1.18 |
| Support activities for agriculture and forestry | 1,210 | 420 | 1,630 | 1.35 | 69 | 30 | 99 | 1.43 |
| **All Other Industries** | **6,435** | **6,038** | **12,473** | **1.94** | **636** | **540** | **1,176** | **1.85** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Congressional District 4



In Indiana's 4th Congressional District, the full impact of agriculture-related activities in 2017 stands at an estimated $10.8 billion in sales (i.e., economic output), $3.3 billion in GDP and 34,180 jobs.

With respect to the employment impact, there were an estimated 18,445 jobs directly supported by agriculture-related establishments. Approximately 65 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 35 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 15,735 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.85, meaning that every direct job in agriculture supports approximately 0.85 jobs in other industries in the region (or every 100 direct jobs create an additional 85 jobs). Likewise, the GDP multiplier of 1.68 suggests that every dollar of GDP directly related to agriculture in the 4th District generates an additional $0.68 in economic activity elsewhere in the district.

Among individual agricultural industries, animal (except poultry) slaughtering, rendering and processing supported the greatest number of jobs in the 4th District at an estimated 6,580 in 2017, which accounted for roughly 20 percent of agriculture's total employment impact in the district. Corn, wheat and other grain farming was the district's second-largest job producer with a total impact of 6,320 jobs. Animal slaughtering, rendering and processing generated the largest contribution to GDP in the 4th District with an estimated total value added impact of $607 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's Fourth Congressional District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 18,445 | 15,735 | 34,180 | 1.85 |
| Production | 11,960 | 7,520 | 19,480 | 1.63 |
| Processing and Manufacturing | 6,485 | 8,215 | 14,700 | 2.27 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 1,276 | 722 | 1,997 | 1.57 |
| Production | 883 | 323 | 1,206 | 1.37 |
| Processing and Manufacturing | 446 | 451 | 896 | 2.01 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 1,963 | 1,332 | 3,295 | 1.68 |
| Production | 1,018 | 634 | 1,652 | 1.62 |
| Processing and Manufacturing | 945 | 698 | 1,643 | 1.74 |

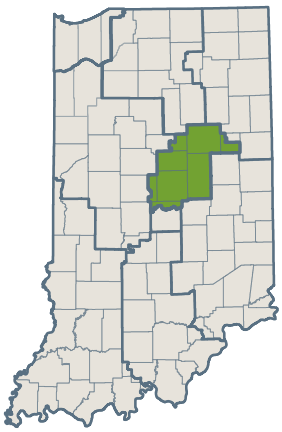
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the Fourth Congressional District 2017, Top 5 Industries

| Industry | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Animal (except poultry) slaughtering, rendering and processing | 3,530 | 3,050 | 6,580 | 1.86 | 376 | 231 | 607 | 1.61 |
| Corn, wheat , and other grain farming | 3,800 | 2,520 | 6,320 | 1.66 | 97 | 240 | 337 | 3.47 |
| Hog and pig production | 3,395 | 987 | 4,382 | 1.29 | 193 | 75 | 268 | 1.39 |
| Soybean and other oilseed farming | 1,260 | 1,930 | 3,190 | 2.53 | 311 | 159 | 469 | 1.51 |
| Support activities for agriculture and forestry | 1,410 | 1,030 | 2,440 | 1.73 | 217 | 75 | 292 | 1.35 |
| **All Other Industries** | **5,050** | **6,218** | **11,268** | **2.23** | **769** | **553** | **1,322** | **1.72** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Congressional District 5



In Indiana's 5th Congressional District, the full impact of agriculture-related activities in 2017 stands at an estimated $3.4 billion in sales (i.e., economic output), $1.2 billion in GDP and 10,950 jobs.

With respect to the employment impact, there were an estimated 5,920 jobs directly supported by agriculture-related establishments. Approximately 55 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 45 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 5,030 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.85, meaning that every direct job in agriculture supports approximately 0.85 jobs in other industries in the region (or every 100 direct jobs create an additional 85 jobs). Likewise, the GDP multiplier of 1.82 suggests that every dollar of GDP directly related to agriculture in the 5th District generates an additional $0.82 in economic activity elsewhere in the district.

Among individual agricultural industries, fruit and vegetable canning, pickling and drying supported the greatest number of jobs in the 5th District at an estimated 1,930 in 2017, which accounted for roughly 18 percent of agriculture's total employment impact in the district. Corn, wheat and other grain farming was the district's second-largest job producer with a total impact of 1,400 jobs. Fruit and vegetable canning, pickling and drying generated the largest contribution to GDP in the 5th District with an estimated total value added impact of $230 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's Fifth Congressional District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 5,920 | 5,030 | 10,950 | 1.85 |
| Production | 3,260 | 1,910 | 5,170 | 1.59 |
| Processing and Manufacturing | 2,660 | 3,120 | 5,780 | 2.17 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 437 | 300 | 737 | 1.69 |
| Production | 265 | 110 | 375 | 1.42 |
| Processing and Manufacturing | 192 | 213 | 406 | 2.11 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 672 | 548 | 1,220 | 1.82 |
| Production | 357 | 195 | 552 | 1.55 |
| Processing and Manufacturing | 315 | 353 | 668 | 2.12 |

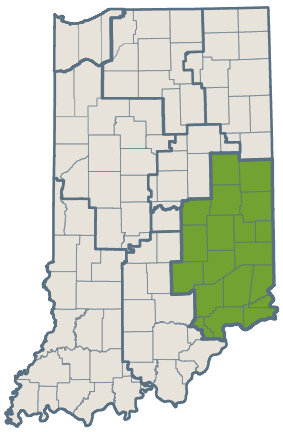
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the Fifth Congressional District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Fruit and vegetable canning, pickling, and drying | 850 | 1,080 | 1,930 | 2.27 | 93 | 138 | 230 | 2.49 |
| Corn, wheat , and other grain farming | 940 | 460 | 1,400 | 1.49 | 21 | 60 | 81 | 3.89 |
| Support activities for agriculture and forestry | 570 | 620 | 1,190 | 2.09 | 139 | 51 | 190 | 1.37 |
| Fluid milk and butter manufacturing | 420 | 640 | 1,060 | 2.52 | 68 | 66 | 134 | 1.97 |
| Soybean and other oilseed farming | 440 | 460 | 900 | 2.05 | 100 | 49 | 149 | 1.49 |
| **All Other Industries** | **2,700** | **1,770** | **4,470** | **1.66** | **252** | **184** | **436** | **1.73** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Congressional District 6



In Indiana's 6th Congressional District, the full impact of agriculture-related activities in 2017 stands at an estimated $4.8 billion in sales (i.e., economic output), $1.5 billion in GDP and 22,860 jobs.

With respect to the employment impact, there were an estimated 15,970 jobs directly supported by agriculture-related establishments. Approximately 82 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 18 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 6,890 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.43, meaning that every direct job in agriculture supports approximately 0.43 jobs in other industries in the region (or every 100 direct jobs create an additional 43 jobs). Likewise, the GDP multiplier of 1.58 suggests that every dollar of GDP directly related to agriculture in the 6th District generates an additional $0.58 in economic activity elsewhere in the district.

Among individual agricultural industries, hog and pig production supported the greatest number of jobs in the 6th District at an estimated 5,104 in 2017, which accounted for roughly 22 percent of agriculture's total employment impact in the district. Corn, wheat and other grain farming was the district's second-largest job producer with a total impact of 4,320 jobs. Soybean and other oilseed farming generated the largest contribution to GDP in the 6th District with an estimated total value added impact of $347 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's Sixth Congressional District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 15,970 | 6,890 | 22,860 | 1.43 |
| Production | 13,160 | 3,950 | 17,110 | 1.30 |
| Processing and Manufacturing | 2,810 | 2,940 | 5,750 | 2.05 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 566 | 314 | 880 | 1.55 |
| Production | 414 | 168 | 582 | 1.41 |
| Processing and Manufacturing | 171 | 159 | 330 | 1.93 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 971 | 566 | 1,537 | 1.58 |
| Production | 680 | 315 | 995 | 1.46 |
| Processing and Manufacturing | 291 | 251 | 542 | 1.86 |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the Sixth Congressional District 2017 Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Hog and pig production | 4,392 | 712 | 5,104 | 1.16 | 167 | 52 | 219 | 1.31 |
| Corn, wheat , and other grain farming | 3,180 | 1,140 | 4,320 | 1.36 | 51 | 101 | 152 | 2.96 |
| Soybean and other oilseed farming | 1,480 | 1,240 | 2,720 | 1.84 | 250 | 97 | 347 | 1.39 |
| Support activities for agriculture and forestry | 1,380 | 260 | 1,640 | 1.19 | 48 | 18 | 66 | 1.38 |
| Cattle ranching and farming | 870 | 80 | 950 | 1.09 | 42 | 6 | 48 | 1.14 |
| **All Other Industries** | **4,668** | **3,458** | **8,126** | **1.74** | **413** | **292** | **705** | **1.71** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Congressional District 7

In Indiana's 7th Congressional District, the full impact of agriculture-related activities in 2017 stands at an estimated $2.4 billion in sales (i.e., economic output), $0.7 billion in GDP and 4,820 jobs.

With respect to the employment impact, there were an estimated 1,810 jobs directly supported by agriculture-related establishments. Approximately 14 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 86 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 3,010 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 2.66, meaning that every direct job in agriculture supports approximately 1.66 jobs in other industries in the region (or every 100 direct jobs create an additional 166 jobs). Likewise, the GDP multiplier of 2.02 suggests that every dollar of GDP directly related to agriculture in the 7th District generates an additional $1.02 in economic activity elsewhere in the district.

Among individual agricultural industries, wet corn milling supported the greatest number of jobs in the 7th District at an estimated 2,140 in 2017, which accounted for roughly 44 percent of agriculture's total employment impact in the district. Wet corn milling was the district's second-largest job producer with a total impact of 820 jobs. Soybean and other oilseed farming generated the largest contribution to GDP in the 7th District with an estimated total value added impact of $396 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's Seventh Congressional District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 1,810 | 3,010 | 4,820 | 2.66 |
| Production | 260 | 40 | 300 | 1.15 |
| Processing and Manufacturing | 1,550 | 2,970 | 4,520 | 2.92 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 138 | 221 | 359 | 2.61 |
| Production | 11 | 3 | 14 | 1.27 |
| Processing and Manufacturing | 127 | 218 | 345 | 2.73 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 349 | 355 | 705 | 2.02 |
| Production | 13 | 5 | 17 | 1.39 |
| Processing and Manufacturing | 337 | 350 | 687 | 2.04 |

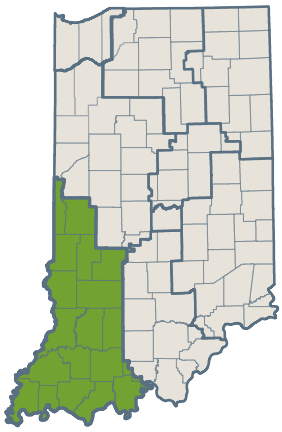
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the Seventh Congressional District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Wet corn milling | 430 | 1,710 | 2,140 | 4.98 | 193 | 203 | 396 | 2.05 |
| Fluid milk and butter manufacturing | 390 | 430 | 820 | 2.10 | 57 | 46 | 102 | 1.81 |
| Flour milling and malt manufacturing | 150 | 370 | 520 | 3.47 | 23 | 45 | 68 | 2.92 |
| Fats and oils refining and blending | 150 | 210 | 360 | 2.40 | 27 | 26 | 53 | 1.94 |
| Veneer and plywood manufacturing | 160 | 90 | 250 | 1.56 | 10 | 10 | 19 | 2.05 |
| **All Other Industries** | **530** | **200** | **730** | **1.38** | **39** | **26** | **65** | **1.66** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Congressional District 8



In Indiana's 8th Congressional District, the full impact of agriculture-related activities in 2017 stands at an estimated $9.0 billion in sales (i.e., economic output), $2.7 billion in GDP and 33,030 jobs.

With respect to the employment impact, there were an estimated 18,840 jobs directly supported by agriculture-related establishments. Approximately 67 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 33 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 14,190 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.75, meaning that every direct job in agriculture supports approximately 0.75 jobs in other industries in the region (or every 100 direct jobs create an additional 75 jobs). Likewise, the GDP multiplier of 1.77 suggests that every dollar of GDP directly related to agriculture in the 8th District generates an additional $0.77 in economic activity elsewhere in the district.

Among individual agricultural industries, corn, wheat and other grain farming supported the greatest number of jobs in the 8th District at an estimated 5,800 in 2017, which accounted for roughly 18 percent of agriculture's total employment impact in the district. Soybean and other oilseed farming was the district's second-largest job producer with a total impact of 3,280 jobs. Dry, condensed, and evaporated dairy product manufacturing generated the largest contribution to GDP in the 8th District with an estimated total value added impact of $400 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's Eighth Congressional District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 18,840 | 14,190 | 33,030 | 1.75 |
| Production | 12,680 | 5,620 | 18,300 | 1.44 |
| Processing and Manufacturing | 6,160 | 8,570 | 14,730 | 2.39 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 990 | 660 | 1,650 | 1.67 |
| Production | 574 | 243 | 817 | 1.42 |
| Processing and Manufacturing | 438 | 453 | 891 | 2.03 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 1,534 | 1,181 | 2,715 | 1.77 |
| Production | 669 | 465 | 1,134 | 1.70 |
| Processing and Manufacturing | 865 | 716 | 1,581 | 1.83 |

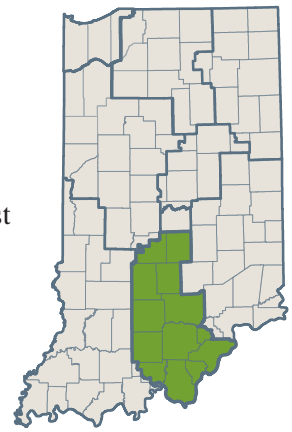
Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the Eighth Congressional District 2017, Top 5 Industries

| Industry | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Corn, wheat , and other grain farming | 4,060 | 1,740 | 5,800 | 1.43 | 65 | 164 | 229 | 3.54 |
| Soybean and other oilseed farming | 1,520 | 1,760 | 3,280 | 2.16 | 240 | 139 | 380 | 1.58 |
| Hog and pig production | 2,511 | 430 | 2,941 | 1.17 | 72 | 31 | 103 | 1.43 |
| Poultry processing | 1,650 | 910 | 2,560 | 1.55 | 98 | 68 | 166 | 1.69 |
| Dry, condensed, and evaporated dairy product manufacturing | 660 | 1,730 | 2,390 | 3.62 | 257 | 142 | 400 | 1.55 |
| **All Other Industries** | **8,439** | **7,620** | **16,059** | **1.90** | **801** | **635** | **1,437** | **1.79** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Congressional District 9



In Indiana's 9th Congressional District, the full impact of agriculture-related activities in 2017 stands at an estimated $2.7 billion in sales (i.e., economic output), $0.9 billion in GDP and 15,340 jobs.

With respect to the employment impact, there were an estimated 10,810 jobs directly supported by agriculture-related establishments. Approximately 68 percent of these jobs were engaged in commodity production, while processing and manufacturing activities accounted for the remaining 32 percent of direct employment. The economic ripple effects spurred by agricultural production combine to create an additional 4,530 jobs in the region.

A helpful way to interpret these impacts is to look at the multipliers. For instance, the ratio of the total employment impact to the direct employment yields a multiplier of 1.42, meaning that every direct job in agriculture supports approximately 0.42 jobs in other industries in the region (or every 100 direct jobs create an additional 42 jobs). Likewise, the GDP multiplier of 1.66 suggests that every dollar of GDP directly related to agriculture in the 9th District generates an additional $0.66 in economic activity elsewhere in the district.

Among individual agricultural industries, corn, wheat and other grain farming supported the greatest number of jobs in the 9th District at an estimated 2,280 in 2017, which accounted for roughly 15 percent of agriculture's total employment impact in the district. Veneer and plywood manufacturing was the district's second-largest job producer with a total impact of 1,580 jobs. Soybean and other oilseed farming generated the largest contribution to GDP in the 9th District with an estimated total value added impact of $138 million.

## The Economic Contributions of Agriculture and Forestry to Indiana's Ninth Congressional District, 2017

| | Direct Effects | Ripple Effects | Total | Multiplier |
|---|---|---|---|---|
| Employment | | | | |
| All Agriculture and Forestry | 10,810 | 4,530 | 15,340 | 1.42 |
| Production | 7,360 | 1,780 | 9,140 | 1.24 |
| Processing and Manufacturing | 3,450 | 2,750 | 6,200 | 1.80 |
| Compensation ($ million) | | | | |
| All Agriculture and Forestry | 351 | 204 | 555 | 1.58 |
| Production | 163 | 76 | 239 | 1.47 |
| Processing and Manufacturing | 188 | 128 | 316 | 1.68 |
| Value Added ($ million) | | | | |
| All Agriculture and Forestry | 547 | 361 | 909 | 1.66 |
| Production | 289 | 146 | 435 | 1.50 |
| Processing and Manufacturing | 258 | 216 | 474 | 1.84 |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## Agriculture and Forestry's Economic Contribution in the Ninth Congressional District 2017, Top 5 Industries

| | Employment Effects | | | | Value Added Effects | | | |
|---|---|---|---|---|---|---|---|---|
| Industry | Direct Effects | Ripple Effects | Total | Multiplier | Direct Effects | Ripple Effects | Total | Multiplier |
| Corn, wheat , and other grain farming | 1,790 | 490 | 2,280 | 1.27 | 18 | 44 | 63 | 3.40 |
| Veneer and plywood manufacturing | 880 | 700 | 1,580 | 1.80 | 57 | 56 | 113 | 1.97 |
| Soybean and other oilseed farming | 900 | 540 | 1,440 | 1.60 | 94 | 43 | 138 | 1.46 |
| Hog and pig production | 1,037 | 78 | 1,115 | 1.08 | 19 | 6 | 25 | 1.31 |
| Cattle ranching and farming | 920 | 50 | 970 | 1.05 | 28 | 4 | 31 | 1.13 |
| **All Other Industries** | **5,283** | **2,672** | **7,955** | **1.51** | **330** | **208** | **538** | **1.63** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

# Appendix

## Data Sources

The IBRC performed the analysis of the crop and livestock production industries using data from the USDA's 2017 Census of Agriculture. The USDA conducts the Census of Agriculture every five years, and the first of the 2017 data were released in early 2019. Results from the census are available for several different levels of geography, including states, congressional districts and counties. The IBRC aggregated county-level data to create estimates for the crop reporting districts.

In cases where a single farm or establishment is the dominant producer in a specific industry in a given geographic area, the USDA will suppress the data for that industry in that geographic area so that they don't reveal information about individual producers. Data suppression can be common in smaller industries and in smaller counties. For this analysis, IBRC researchers estimated values for any suppressed data cells. The basic estimation approach was to sum the actual reported values for each Indiana county in a given industry and then find the difference, or residual, between that total and the state total in the same industry. The residual was then allocated proportionally to each suppressed county based on these county's output estimates in the corresponding industry in their IMPLAN models for 2017. In some cases, the USDA would publish county rankings for suppressed industries, which the research team could use to determine if the estimates we generated were reasonable, and to make adjustments if not. The estimated data were then controlled to county and state totals.

For the analysis of processing and manufacturing industries, the research team relied on the output estimates for each industry in each geographic area found in the 2017 IMPLAN models. IMPLAN derives these numbers primarily from U.S. Bureau of Economic Analysis and USDA data, and they cover both wage and salary workers and the self-employed.

## Defining Agriculture and Forestry

One challenge in this analysis was deciding which collection of industries properly defines agriculture and forestry. The selection of production industries is straightforward; the research team simply included all industries in sector 11 of the NAICS industry classification scheme with the exception of fishing, hunting and trapping (subsector 114). The NAICS subsectors for production included in this study are crop production, animal production, forestry and logging, and support activities for agriculture and forestry.

The selection of processing and manufacturing industries was trickier. There have been several studies similar to this one conducted in other states. Some have used very broad definitions of agriculture that include nearly all types of food, fabric and wood product manufacturing, while others have attempted to focus their analysis on processing industries that are most closely tied to the farm or forest. The IBRC research team selected the latter approach so as not to inflate the impact estimates with industries that have little direct link to Indiana agriculture.

The research team used the IMPLAN model to help distinguish which industries it considered primary agricultural processing and manufacturing. The IMPLAN model features production functions for each industry, which are akin to a recipe of the production inputs that each industry needs to produce its output. These production functions also include regional purchase coefficients (RPCs), which are estimates of the share of each production input that is supplied by other Indiana firms. The research team used the RPCs to calculate for each industry the share of production inputs that are sourced from Indiana, and used this criteria to select the list of industries to include in this analyses.

**Table 8** lists each industry that was included in this analysis along with each industry's total contribution to Indiana output, value added and employment (total effects = direct + indirect+ induced effects).

## Adjustments to the IMPLAN Model

As mentioned in the body of the report, the research team adjusted the IMPLAN model to eliminate double counting in the estimates of indirect and induced effects. Without adjustments, the economic activity and employment related agricultural industries would be double counted when these industries supply production inputs to one another. Researchers followed the procedures outlined by the IMPLAN Group to avoid double counting when conducting multi-industry contribution analysis. These adjustment procedures are online at "Multi-Industry Contribution Analysis" (https://implanhelp.zendesk.com/hc/en-us/articles/115009542247-IMPLAN-Pro-Multi-Industry-Contribution-Analysis).

## Key Terms

**Direct Effects**: Refers to the increase in final demand or employment in Indiana that can be attributed specifically to agriculture or forestry.

**Ripple Effects:** A combination of the indirect and induced effects generated by the direct effects. Indirect effects measure the change in GDP or employment caused when businesses engaged in agriculture increase their purchase of goods and services from suppliers and, in turn, those suppliers purchase more inputs and so on throughout the economy. Induced effects reflect the changes—whether in GDP or employment—that result from the household spending of workers directly linked to agriculture, along with the employees of its suppliers.

**Total Effects**: The total of all economic effects is the size of the economic impact and is the sum of the direct and ripple effects.

**Tax Effects**: The IMPLAN model tracks the tax effects associated with all the transactions and economic activity associated with the direct and ripple effects. For example, household spending at retailers generates state sales tax. In addition, those retailers pay property taxes to local governments. As a result, this analysis was also able to estimate the federal, state and local government tax flows.

**Multiplier**: The multiplier is the magnitude of the economic response in a particular geographic area associated with a change—either an increase or a decrease—in the direct effects.

**Compensation:** Includes both the wages and benefits paid to employees as well as proprietors' income.

**Value Added:** Also known as gross domestic product (GDP), value added is the difference between an industry's total output and the cost of its production inputs. Value added consists of four components: employee compensation, proprietor income, other property income and indirect business tax.

### Table 8: Total Economic and Employment Contributions of Each Agriculture and Forestry Industry

| Description | Total Output ($ million) | Total Employment |
|---|---|---|
| Soybean and other oilseed farming | 2,394 | 17,760 |
| Corn, wheat, and other grain farming | 1,780 | 30,520 |
| Vegetable and melon farming | 133 | 1,450 |
| Fruit farming | 16 | 360 |
| Greenhouse, nursery, and floriculture production | 133 | 1,860 |
| Tobacco farming | 3 | 40 |
| All other crop farming | 94 | 3,660 |
| Cattle ranching and farming | 401 | 7,290 |
| Dairy cattle and milk production | 477 | 4,440 |
| Poultry and egg production | 647 | 6,840 |
| Hog and pig production | 1,259 | 26,408 |
| All other animal production | 52 | 1,082 |
| Forest nurseries, forest products, and timber tracts | 11 | 130 |
| Logging | 265 | 2,110 |
| Support activities for agriculture and forestry | 927 | 11,650 |
| Flour milling and malt manufacturing | 375 | 3,390 |
| Wet corn milling | 1,386 | 9,890 |
| Soybean and other oilseed processing | 619 | 4,980 |
| Fats and oils refining and blending | 164 | 1,350 |
| Non-chocolate confectionery manufacturing | 304 | 2,660 |
| Chocolate and confectionery manufacturing from cacao beans | 17 | 110 |
| Confectionery manufacturing from purchased chocolate | 154 | 1,850 |
| Frozen food manufacturing | 155 | 1,820 |
| Fruit and vegetable canning, pickling, and drying | 358 | 3,750 |
| Canned specialties | 241 | 1,880 |
| Dehydrated food products manufacturing | 88 | 1,060 |
| Fluid milk and butter manufacturing | 539 | 4,980 |
| Cheese manufacturing | 228 | 1,840 |
| Dry, condensed, and evaporated dairy product manufacturing | 507 | 3,250 |
| Ice cream and frozen dessert manufacturing | 196 | 1,600 |
| Animal (except poultry) slaughtering, rendering, and processing | 1,359 | 15,250 |
| Poultry processing | 446 | 6,370 |
| Seafood product preparation and packaging | 6 | 140 |
| All other food manufacturing | 485 | 5,640 |
| Sawmills and wood preservation | 293 | 3,990 |
| Veneer and plywood manufacturing | 239 | 3,170 |
| Engineered wood member and truss manufacturing | 251 | 3,500 |
| Ethanol production | 378 | 2,000 |
| **Total** | **17,380** | **200,070** |

Source: IBRC, using data from the USDA and the IMPLAN economic modeling software

## About IMPLAN Economic Impact Modeling Software

MIG, Inc. (formerly the Minnesota IMPLAN Group) is the company responsible for developing IMPLAN data and software. Using classic input-output analysis, IMPLAN can be used to measure the economic effects of an economic event, such as a factory closing or a new plant opening, or the size of the economic footprint of an economic entity like a production facility, headquarters or university.

## The Economic Theory behind IMPLAN

IMPLAN is built on a mathematical input-output (I-O) model that expresses relationships between sectors of the economy in a chosen geographic location. In expressing the flow of dollars through a regional economy, the input-output model assumes fixed relationships between producers and their suppliers based on demand. It also omits any dollars spent outside of the regional economy—say, by producers who import raw goods from another area or by employees who commute and do their household spending elsewhere.

The idea behind input-output modeling is that the inter-industry relationships within a region largely determine how that economy will respond to economic changes. In an I-O model, the increase in demand for a certain product or service causes a multiplier effect, layers of effect that come in a chain reaction. Increased demand for a product affects the producer of the product, the producer's employees, the producer's suppliers, the supplier's employees, and so on, ultimately generating a total effect in the economy that is greater than the initial change in demand. Say demand for Andersen Windows' wood window products increases. Sales grow, so Andersen has to hire more people, and the company may buy more from local vendors, and those vendors in turn have to hire more people … who in turn buy more groceries. The ratio of that overall effect to the initial change is called a regional multiplier and can be expressed like this:

**(Direct Effect + Indirect Effects + Induced Effects) / (Direct Effect) = Multiplier**

Multipliers are industry and region specific. Each industry has a unique output multiplier, because each industry has a different pattern of purchases from firms inside and outside of the regional economy. (The output multiplier is in turn used to calculate income and employment multipliers.)

Estimating a multiplier is not the end goal of IMPLAN users. Most wish to estimate other numbers and get the answers to the following questions: How many jobs will this new firm produce? How much will the local economy be affected by this plant closing? What will the effects be of an increase in product demand? Based on those user choices, IMPLAN software constructs "social accounts" to measure the flow of dollars from purchasers to producers within the region. The data in those social accounts will set up the precise equations needed to finally answer those questions users have—about the impact of a new company, a plant closing or greater product demand—and yield the answers.

IMPLAN constructs its input-output model using aggregated production, employment, and trade data from local, regional, and national sources, such as the U.S. Census Bureau's annual County Business Patterns report, and the U.S. Bureau of Labor Statistics' annual report called Covered Employment and Wages. In addition to gathering enormous amounts of data from government sources, the company also estimates some data where they haven't been reported at the level of detail needed (county-level production data, for instance), or where detail is omitted in government reports to protect the confidentiality of individual companies whose data would be easily recognized due to a sparse population of businesses in the area.

IMPLAN's accessibility and ease of use also make it a target of criticism by some economists, who charge that in the wrong hands, the software—or any input-output model—will produce inflated results at best, and at worst, completely ridiculous projections. Anyone can point and click their way to an outcome without fully understanding the economics in which the tool is grounded and without knowing how to look at data sets with a nuanced eye. The IBRC has two analysts that have attended advanced training in the use of the IMPLAN modeling software. The estimates that the IBRC analysts generate are pressure-tested and triple-checked to ensure that they are accurate and reflect the most trustworthy application of the modeling software. In all instances, the most conservative estimation assumptions and procedures are used to produce the IMPLAN results.