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Executive Summary

Agriculture and associated agricultural activities are major contributors to the Arkansas economy. Agriculture is defined as the sum of agricultural production and processing activities, unless otherwise specified, and includes crop and animal production and processing, agricultural support industries, forestry and forest products, and textile goods. Agriculture contributes to the economy through direct agricultural production and value-added processing, and also leads to economic activity in other parts of the economy.

This report is the third in a series of biennial reports examining agriculture's impact on the Arkansas economy. Utilizing data from the United States Bureau of Economic Analysis, USDA Economics Research Service, USDA National Agricultural Statistics Service, and Minnesota IMPLAN Group, Inc., the economic impact of agriculture on the Arkansas economy was estimated for the most recent year available, 2003. Gross State Product (GSP) information for Arkansas was compared with those of other states in the southeast U.S. to give a measure of the realitve importance of agriculture in Arkansas. The total impact of agriculture (direct, indirect, and induced effects) on value added, employment, and labor income was estimated by employing the Impact Analysis for Planning System (IMPLAN). Government payments are not included in induced impacts of farm production. Economic impacts of agricultural production and processing were estimated for agriculture as a whole and also separately for the Crops Sector, the Animal Agriculture Sector, and the Forestry Sector. Key findings of the IMPLAN analysis are as follows:

- Agriculture adds $15.28B in total value to the state economy; roughly $0.20 of every $1 in value generated in the state. Arkansas agriculture contributes a larger percentage of total economic activity to the state than is contributed by any other state in the Southeastern US – 10.1% of total GSP (or value added) of $74.54B.

- Agriculture accounted for 286,940 jobs, nearly one of every five jobs in the state. Direct employment in agriculture is 171,281, 12% of all state employment

- Poultry production and processing alone provides almost 1 in 6 of the state's agricultural jobs.

- Agriculture pays $8.94B in labor income, or 19% of the state's total labor income; directly, agriculture payrolls total $5.23B, or 11% of the state total.

- Agriculture generates value added, employment, and wages in all twenty of the 2-digit NAICS aggregated industries in the state. Roughly 45% of agriculture's contribution occurs in industries outside of agriculture such as Wholesale and Retail Trade, Transportation, and Health and Social Services.

- The direct impacts of the Crops Sector include $2.85B in value added, 58,456 jobs and $1.59B in labor income. Grain Farming, Oilseed Farming, and Cotton Farming together represented 60% of jobs, 43% of labor income, 11% of wages, and 40% of value added in the Crops Sector.

- In direct impacts, the Animal Agriculture Sector generates $3.05B in value added, 62,233 jobs and $1.72B in labor income. The Poultry and Egg Production and the Poultry Processing Sectors provide 72% of jobs, 86% of income and 87% of value added in the Animal Agriculture Sector.

- The direct impacts of the Forestry Sector include $2.60 B in value added, 37,291 jobs, and $1.51B in income. Within the Forestry Sector, Sawmills, Logging, and Paper and Paperboard Mills contribute 44% of forestry jobs, and almost half of forestry income and value added.

Arkansas' Agricultural Sector rebounded in 2003 and continues to be a critical component of Arkansas' economy. Agriculture in Arkansas contributes a larger share to the state's economy than does agriculture in the neighboring Southeast states and the US. Including multiplier effects, agriculture generates nearly one in five jobs and 20 percent of value added in the state. The diversity of the state's agriculture helps to mitigate the effect of low world market prices or trade embargoes for a particular commodity. Crops, Animal Agriculture, and Forestry production and processing are all major contributors to agriculture and the state's economy. The large and diverse natural resource base of the state provides the opportunity for agriculture to change and develop new value added and bio-energy industries. The size and diversity of the state's agriculture contribute greatly to the well-being of Arkansans and stability of the state's economy.

Definitions & Styles

Agricultural Sectors

Aggregate Agriculture consists of the Crops, Animal Agriculture, and Forestry Sectors' production and processing industries, plus other agriculture-related industries. See Appendix B, Tables 1-4 for complete listing of the sectors included.

Agriculture Related Sector comprises those industries that support the Crops, Animal Agriculture, and Forestry sectors. See Appendix B, Table 4 for a complete listing of the industries included.

Crops Sector comprises those industries directly involved in crop production and processing. See Appendix B, Table 1 for a complete listing of the industries included.

Animal Agriculture Sector comprises those industries directly involved in livestock production and processing. See Appendix B, Table 2 for a complete listing of the industries included.

Forestry Sector comprises of those industries directly involved in forestry production and processing. See Appendix B Table 3, for a complete listing of the industries included.

Economic Impacts

Employment includes all wage and salary employees, as well as self-employed workers in a given sector.

Labor Income consists of two parts. First is proprietary income, which includes all income received by self-employed individuals including private business owners, doctors, lawyers, etc. Second is wages, which includes all worker salaries, payments, and fringe benefits paid by employers.

Value Added includes all payments to workers (labor income) plus indirect taxes and other property-type income such as payments for rents, royalties, and dividends. Value added is directly comparable to GSP and GDP (but is not equivalent to those measures).

Direct Impacts are the sum of the impacts of farm production and processing of farm products. Only direct impacts are reported for the Crops Sector, Animal Agriculture Sector and Forestry Sector discussions.

Indirect Impacts result when agricultural firms purchase raw materials and services from other Arkansas businesses to produce their products.

Induced Impacts result when employees of agricultural firms and employees of the raw material and service firms spend a portion of their income on local purchases. Government payments are not included here in the calculation of induced impacts.

Style Notes

This report consists of two parts. In the first part, information about Arkansas agriculture is presented in a historical context. In the second part the impacts of agriculture on the Arkansas economy are presented for one year, 2003. Throughout the report, agriculture is defined in terms of agricultural sectors, NAICS sectors, industries, and general descriptive terms that can be applied to agriculture. Different font styles are used throughout the text to distinguish these terms.

Agricultural Sectors comprise the areas of agriculture focus in our study. These sectors are capitalized throughout the report. The first part of the report refers to the overall Agricultural Sector. In the second part of the report we refer to the four areas of analysis: Crops Sector, Animal Agriculture Sector, Forestry Sector, and Aggregate Agricultural Sector.

NAICS Sectors. The North American Industry Classification Scheme is "…an industry classification system used by statistical agencies to facilitate the collection, tabulation, presentation, and analysis of data relating to establishments….Under NAICS, an establishment is classified to one industry based on its primary activity" (USCB, 2004). Agricultural activities are classified under, or can impact, multiple Super Sectors. Throughout the document, capitalization of sectors is used when referring to NAICS sectors. Examples include Food Manufacturing, Paper Manufacturing, and Wood Product Manufacturing.

Industries are individual industries that can be aggregated to create NAICS sectors or the Agricultural Sectors used in our analysis. These industries are capitalized and italicized. Examples include *Poultry and Egg Production* and *Paperboard Mills*.

General Descriptive Terms are terms used throughout the text to describe agriculture that are not related to established industry classification schemes or specific agricultural sector titles used in this analysis. These terms are presented in lower case. Examples include agricultural production and agricultural processing.

The Impact of Agriculture in Arkansas

Introduction

Agriculture and associated agricultural activities are major contributors to the Arkansas economy. While agriculture contributes to the economy through direct agricultural production and value-added processing, it also plays an important role through its interactions with other sectors. The use of non-agricultural goods and services as inputs into the Agricultural Sector promotes diversified growth in Arkansas' economy, thereby allowing agriculture to remain a vital part of the Arkansas state economy.

This report:

- compares the relative size of the Agricultural Sector in Arkansas and those of neighboring states, the Southeastern region of the United States, and the nation;
- provides an overview of Arkansas' economy and discusses Arkansas' Agricultural Sector in relation to the state economy;
- examines components of agricultural production and processing, including a review of historical sales trends for raw and processed agricultural output;
- compares impacts of agriculture on the Arkansas economy in 2001 and 2003 and discusses possible reasons for these changes over time; and
- discusses the overall impact of agriculture on Arkansas' economy, considering the direct, indirect, and induced effects of the Agricultural Sector.

This report builds upon similar reports by Miller and Sato (1999), Goodwin et al. (2002), and Popp et al. (2005). This report utilizes data for 2003, the most recent year for which all relevant data are available. All dollar values are expressed in 2003 constant terms, unless otherwise noted.

A Note Regarding Presentation of Gross State Product Estimates

Prior reports (Goodwin et al., 2002; Popp et al., 2005) made comparisons of historical gross state product (GSP) data from the Bureau of Economic Analysis (BEA) from 1986 to present. However, there is now a discontinuity in the GSP time series at 1997. This discontinuity results from the BEA's change in methods for classifying data from the Standard Industrial Classification (SIC) to the North American Industrial Classification System (NAICS) scheme. GSP data estimates for 1997 forward are now prepared for 81 NAICS industries. Estimates for earlier data years remain in only the 63 SIC industry format. The differences between SIC- and NAICS-based industries are many, including the facts that these estimates are based on different source data and different estimation methodologies. Additionally, the NAICS-based GSP estimates are consistent with US gross domestic product (GDP), while the SIC-based GSP estimates were consistent with US gross domestic income (GDI). The data discontinuity affects the dollar values, industry categories - particularly with respect to manufacturing components - (see Appendix A for changes relevant to the discussion of agriculture) and the growth rates of the GSP estimates. The BEA strongly cautions analysts using the GSP estimates against appending the two data series in an attempt to construct a single time series of GSP estimates for 1977 to 2004 (USDC, BEA, 2006a). Due to these reasons, this study reports only GSP estimates since 1997.

Agriculture - The Regional Context

In the following discussion, the Agricultural Sector is defined as the sum of agricultural production and processing, unless otherwise mentioned. Gross State Product (GSP) data, published by the BEA, are used to measure agricultural production and processing. Arkansas' Agricultural Sector, expressed as a percentage of total GSP, has exceeded those of contiguous states since at least 1969, when the BEA began publishing regional GSP information; this sector also accounts for a larger percenatage of GSP in Arkansas' economy than do the agricultural sectors of the Southeast region and the nation in their respective economies. In 2003, the Agricultural Sector accounted for 10.1% of Arkansas' GSP (Table 1) as compared to 10.6% in 2001; while similarly agriculture in the Southeast region also experienced a 0.5% drop as a percentage of GSP from 2001 to 2003. Still, Arkansas' Agricultural Sector as a percentage of GSP is more than two and a half times greater than that of the United States' (US) agricultural sector as a percentage of its Gross Domestic Product (GDP) in 2003.

Table 1. The agricultural sector as a percentage of gross state product, 2003[a]

State / Region	Percent of GSP
Arkansas	10.09
Louisiana	2.91
Mississippi	8.52
Missouri	4.90
Oklahoma	4.30
Tennessee	4.86
Texas	2.78
Southeast	5.91
U.S.	3.86 [c]

Source: USDC, BEA, Regional Accounts Data (2003)

[a] Current 2003 dollars

[b] In 2003, the BEA data for the Southeast region includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia

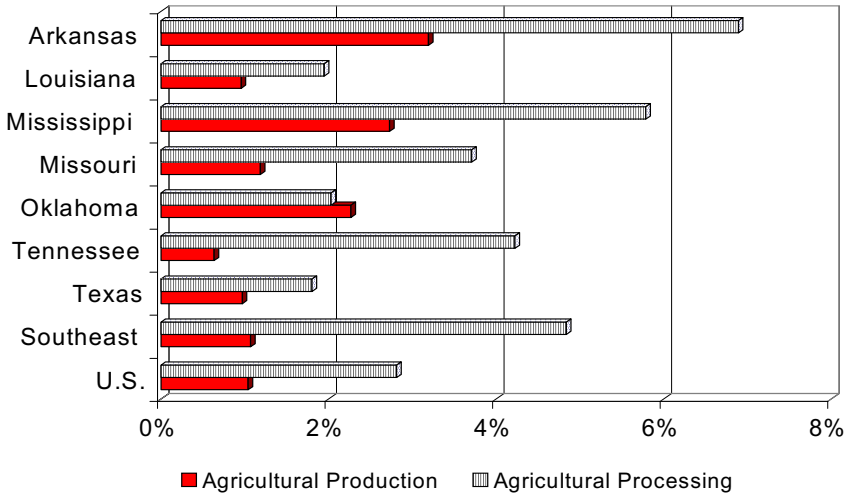
[c] Agriculture is measured as a percent of GDP for the U.S. GDP is the equivalent measure of GSP used for the nation

The individual contributions of agricultural production and processing also comprise a greater percentage of Arkansas' GSP than agricultural production and processing do in neighboring states' and the nation's respective economies (Figure 1). Agricultural production contributed 3.2% to Arkansas' GSP in 2003, whereas agricultural production in Mississippi, contributed only 2.7% to its GSP. Similarly, agricultural processing, the largest component of Arkansas' Agricultural Sector, contributed 6.9% to the state's total GSP, whereas agricultural processing contributed only 5.8% to Mississippi's total GSP.

Overall, Agriculture's share of total GSP in the Southeast has fallen between 2001 and 2003, due to recent changes in the way the Bureau of Economic Analysis has defined agriculture and increased contributions from other sectors towards GSP. However, in 2003, Arkansas remains number one out of six contiguous states in terms of agricultural production and processing as a percentage of GSP.

The diversity of Arkansas' Agricultural Sector fosters its strength. Arkansas' varied climate and terrain allows for row crops in the east, livestock and poultry in the west, and forestry in the south. Arkansas is one of the top fifteen states in the production of fifteen different agricultural products (Justice, 2002), and in the nation, Arkansas is the leading producer of rice and eggs, the second leading producer of broilers, the third largest producer of catfish, and the fourth leading producer of turkey (Bell, 2006; USDA ERS, 2006a). Arkansas also has a large percentage of forestland, equal to 56% of its total land base (UACES,

Figure 1. Production and processing as a percentage of gross state product, 2003[a]



Source: USDC, BEA (2006b)

[a] Current 2003 dollars

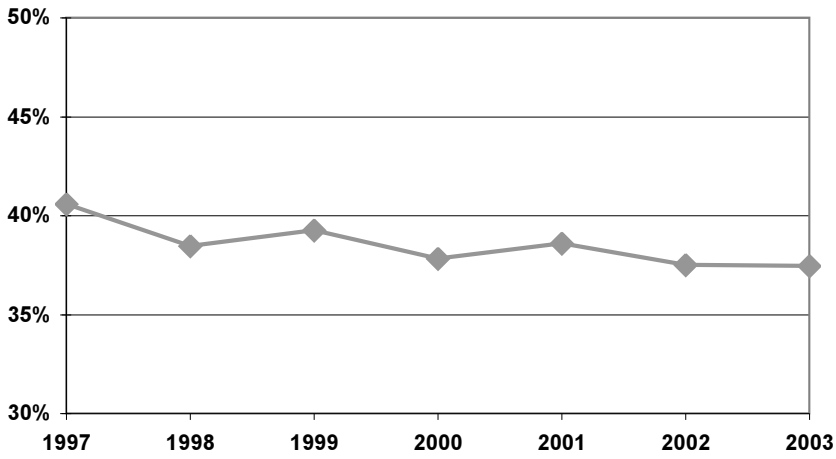
[b] The BEA includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia in the Southeast region

2006), where relatively low-valued timber is processed to produce higher-valued products (e.g., lumber, paper, and furniture). Note that in Figure 1, states that are more than 50% forested, including Arkansas, Mississippi, and Tennessee, tend to have high values of agricultural processing. Oklahoma, the only state contiguous to Arkansas with a lower value of agricultural processing than production, is only 17% forested (American Forest and Paper Association, 2001).

Agriculture and the Arkansas Economy

In 2003, Arkansas' total GSP was equal to $74.5B (current dollars) (USDC, BEA, 2006b) with the Agricultural Sector contributing 10.1% to the total. Agricultural production contributed $2.4 B (current dollars) or 3.2% (Figure 2) and processing contributed $5.1B (current dollars) or 6.9% of GSP. Food Manufacturing, Paper Manufacturing, and Wood Product Manufacturing account for most of Arkansas' agricultural processed goods. These industries are discussed further in the "Processed Agricultural Products" section.

Figure 3. Agricultural processing's share of manufacturing GSP, 1997-2003[a]



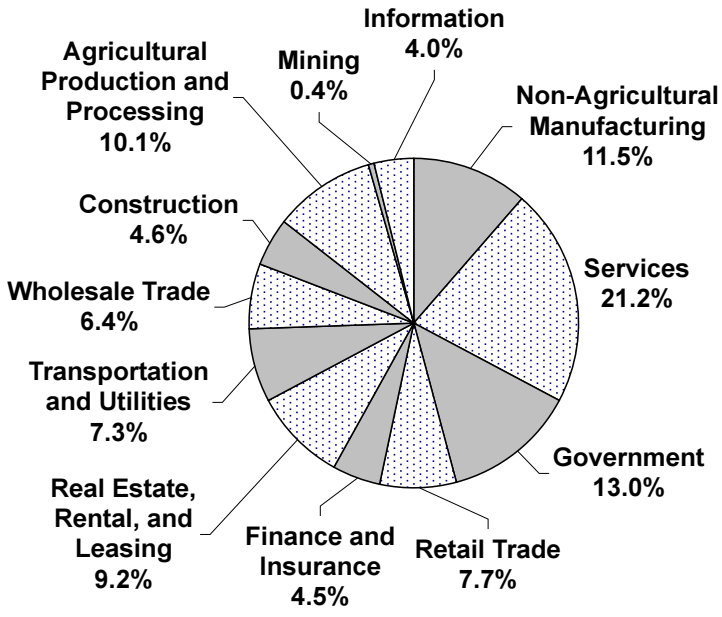
Source: USDC, BEA (2006b)
[a] Constant 2003 dollars

From 1997 to 2001, the GSP of manufacturing fell by 6.6%; however, from 2001 to 2003, it actually grew by 4.2%, leaving a net 2.4% loss from 1997 to 2003 (Figure 3). From 1997 to 2001, the GSP of agricultural processing fell by 10.9%. However, between 2001 and 2003, agricultural processing as a percentage of manufacturing actually decreased by only 1.1%, This indicates that while the GSP of agricultural processing has increased recently, other manufacturing sectors are increasing at a higher rate. For example, GSP in the computer and electronic product manufacturing sector grew 371% from 1997 to 2003 and 49% from 2001 to 2003; GSP in the petroleum and coal products manufacturing sector grew 102% from 1997 to 2003 and by 27% from 2001 to 2003.

The contribution of the Agricultural Sector to Arkansas' GSP fell by 2.1% between 1997 and 2003 (Figure 4). Much of this loss is explained by falling prices for agricultural products between 1997 and 2002. GSP in the Agricultural Sector as percentage of state GSP was at a low point in 2002 at 9.8% but then rebounded in 2002 to 10.1%. The recent increase in the Agricultural Sector's GSP is explained by strong international and domestic demand for agricultural products, which has improved prices dramatically.

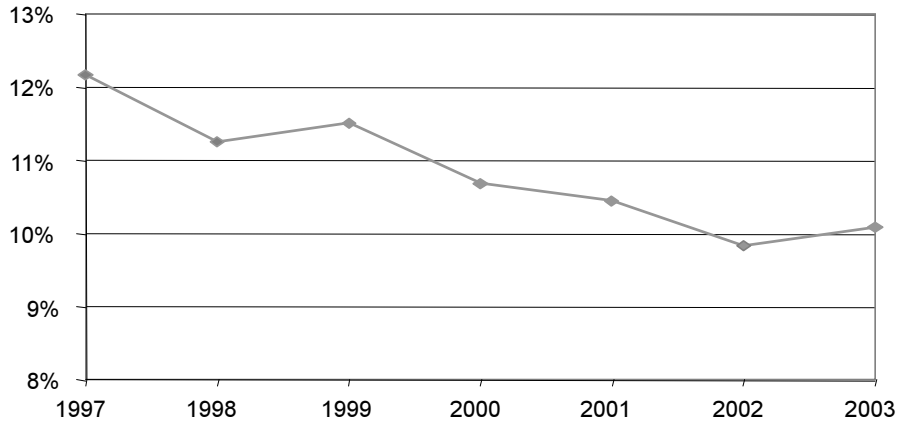
In 1999, Arkansas' Agricultural Sector's GSP peaked at $8.2B (Figure 5). From 1999 to 2002, Agricultural Sectors' share of GSP fell 12.8% to about $7.2B. But 2003 was a record year for output and prices for the Crops and Animal Agriculture production sectors, resulting in increases in agricultural production's share of GSP by 11.3% between 2002 and 2003 (Figure 6). The Agricultural Sector's share of GSP rebounded in 2003 to $7.5B, with agricultural processing's share of GSP also increasing (2.5%) in that same time period, though not to the extent incurred by agricultural production sectors.

Figure 2. Sector percentages of Arkansas' gross state product, 2003[a]



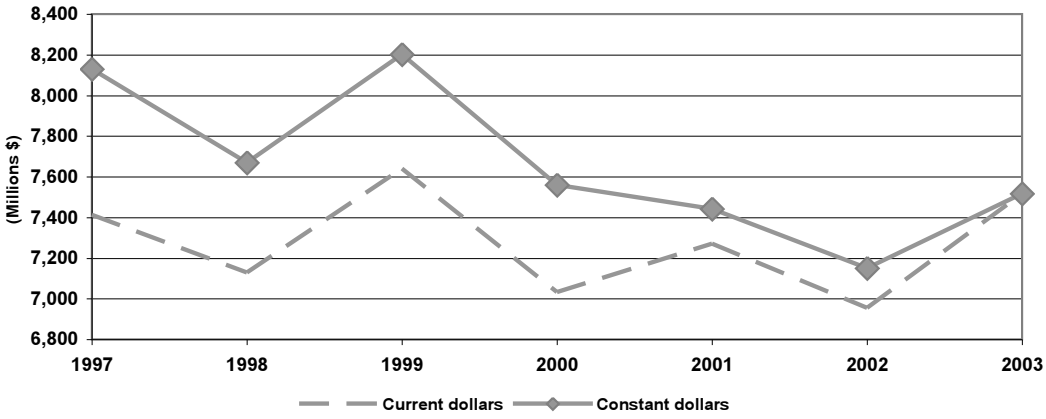
Source: USDC, BEA (2006b)
[a] Current 2003 dollars

Figure 4. The agricultural sector's share of Arkansas gross state product, 1997-2003[a]



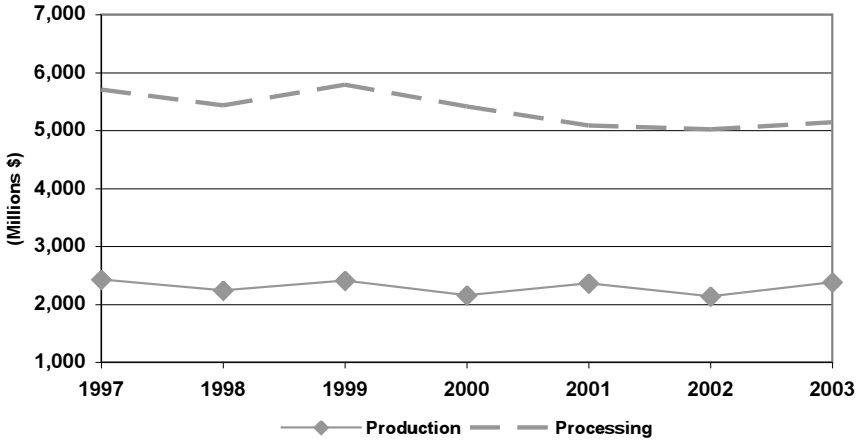
Source: USDC, BEA (2006b)
[a] Constant 2003 dollars

Figure 5. Arkansas' agricultural sector gross state product, 1997-2003[a]



Source: USDC, BEA (2006b)
[a] Constant 2003 dollars

Figure 6. Gross state product for Arkansas' agricultural production and processing, 1997-2003[a]



Source: USDC, BEA (2006b)
[a] Constant 2003 dollars

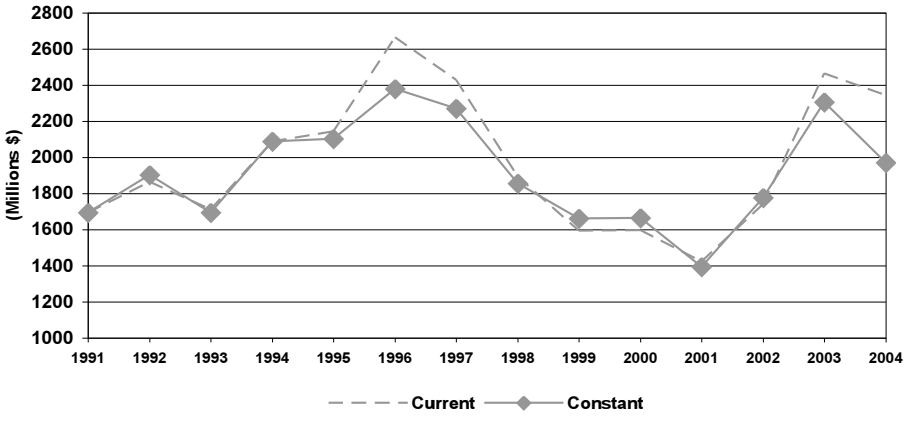
Agricultural Production

Crop and animal production, forestry, aquaculture, and horticulture are the primary agricultural production industries found in Arkansas. The GSP of agricultural production declined 11.9% from 1997 to 2002, but had almost fully recovered by 2003. The growth of agricultural production's GSP stalled in these years due to low agricultural prices in the world market, especially in the Crops Sector, and barriers to poultry exports also contributed to the decline. Since 2002, however, crop and animal agriculture markets have improved. Crop output and prices have improved and prices available to farmers for sales of animal agriculture and products were substantially higher in 2003 and 2004, which contributed to record years for farm income for US farmers.

Crops Production

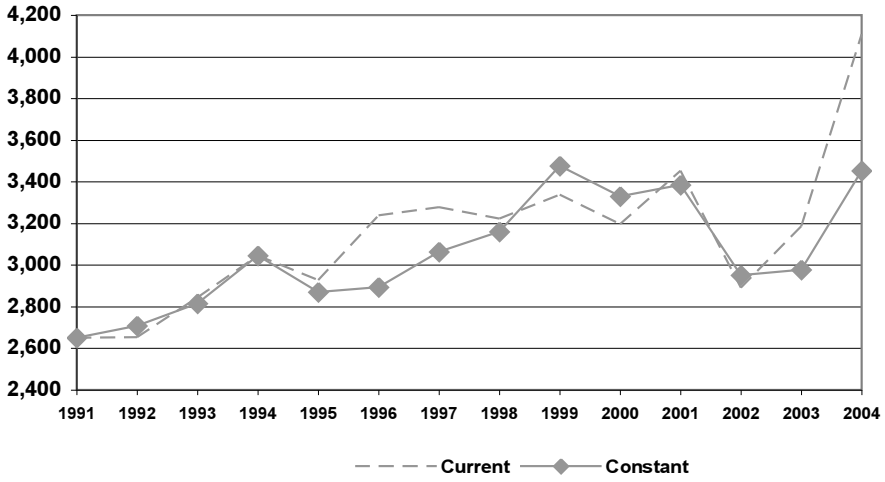
While crops production continues to be an important part of Arkansas' economy, the sales value of crops production has experienced periods of increase and decline since 1991 (Figure 7). In 2001, crop sales fell to their lowest level since 1991. However, from 2001 to 2003 crops prices and exports, along with strong domestic and international demand for products greatly improved; as a result, the value of crops production jumped 65.2%. The total market value (in constant dollars) of crop production in Arkansas though dropped between 2003 and 2004. During that time period there was a general increase in output and prices for agricultural products in the US. In Arkansas, cotton, rice and soybean output increased, but prices did not.

Figure 7. Arkansas' crops production sales, 1991-2004[a]



Source: Computed using data from the USDA, NASS (2004).
For selected crops: Rice, Soybeans, Cotton, Hay, Wheat, Corn, Sorghum, and Oats
[a]Note base year of 1990-1992

Figure 8. The value of Arkansas' animal agriculture production, 1991-2004[a]



Source: USDA, ERS (2006b)
For selected livestock: Broilers, Cattle and Calves, Eggs, Turkeys, Hogs and Pigs, Milk, Catfish, Farm Chickens, and Honey
[a]Constant 1990-1992 dollars

Animal Production

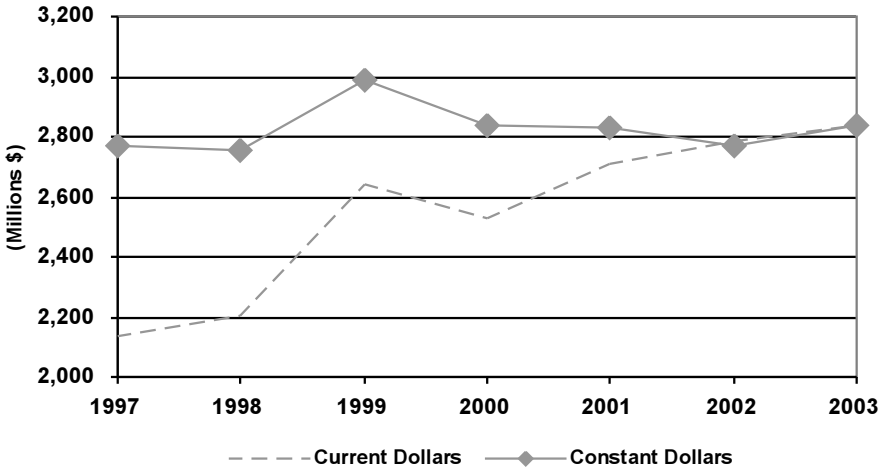
Animal production is also a major component of Arkansas' agricultural production. The value of animal production from 1991 to 2004 (USDA, ERS, 2006b). Cash receipts data, which measure income from sales and marketings were used to measure the value of animal production from 1991 to 2001 (Figure 8). The values of broilers, cattle and calves, eggs, turkeys, hogs and pigs, milk, catfish, farm chickens, and honey production constitute the animal agriculture production data found in Figure 8.

As explained in Popp et al. (2005), the Animal Agriculture Sector is susceptible to changes in global agricultural policies. Instability in Russia, Japan, and Hong Kong negatively impacted trade during the late 1990s through 2002, resulting in fewer livestock purchases (particularly poultry) and depressed world prices. However, as with crops production, the livestock market has improved greatly since 2002; between 2002 and 2004, the market value of livestock increased 17% to $4.1B (in current dollars). Market prices to farmers for sales of livestock and livestock products (milk, eggs, etc) were substantially higher in 2003 and 2004 when compared to earlier years and have been a primary force in improved farm incomes for livestock producers.

Forestry Production

As mentioned in earlier studies, the state of Arkansas does not require sawmills to disclose the price paid for timber (Levins, 2002); therefore, it is not possible to produce an accurate representation of the value of the forestry industry. Forestry production, however, is essential to Arkansas' economy. Foresters supply wood product manufacturers with raw materials. Arkansas' timber is fundamental to such industries as paper, lumber and wood, and furniture and fixtures. As will be discussed later, processed goods derived from forestry production are the third largest component of processed agricultural goods, in terms of employment, labor income, and value added.

Figure 10. The gross state product of food product manufacturing, 1997-2003[a]



Source: USDC, BEA (2006b)
[a] Current and constant 2003 dollars

Agriculture-Related Industries

Agriculture-related industries include commercial fishing, hunting and trapping from the natural environment (not farm raised), agriculture and forestry support activities (e.g., cotton ginning and crop dusting), and on-farm construction. The largest of these industries is agriculture and forestry support activities. These activities may be performed by an independent firm as an input required for the production process for a given crop, animal, or forestry industry. Typical activities include but are not limited to: cotton ginning; soil preparation, planting, and cultivating; and breeding services and livestock sprayers. As will be discussed later, the support activities sector alone employed over 12,000 in 2003.

Agricultural Processing

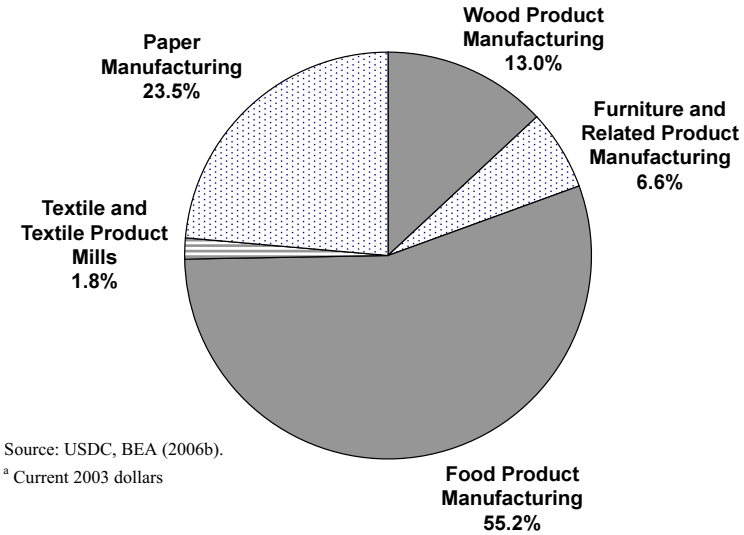
Processed crop, livestock, forestry, and other agricultural products are an integral part of agriculture in Arkansas. Arkansas' manufacturing sector depends upon raw materials from the crop, animal agriculture, and forestry sectors for use in many of its largest industries. Broiler production and processing, for example, may lead to such processed goods as frozen chicken, eggs, animal feed, and animal oils.

The contribution of individual agricultural processing industries to agricultural processing in 2003 is shown in Figure 9. Each industry's share of agricultural processing was relatively constant between 2001 and 2003. A discussion of each industry's value over time, as a percentage of GSP, follows.

Food Product Manufacturing

The food product manufacturing sector is the largest agricultural processing sector in Arkansas, accounting for 55.2% of agricultural processing's GSP. The food product manufacturing sector's GSP grew 7.9% from 1997 to 1999 but then dropped 7.35% from 1999 to 2002 (Figure 10). Since 2002, the sector has increased by 2.3%. Much of this growth is explained by the resolution of many trade issues between Russia and Mexico; these vents have lead to an increase in poultry exports to those countries, with Arkansas remaining the leader of poultry exports in the US.

Figure 9. Components of Arkansas' agricultural processing sector, GSP, 2003[a]

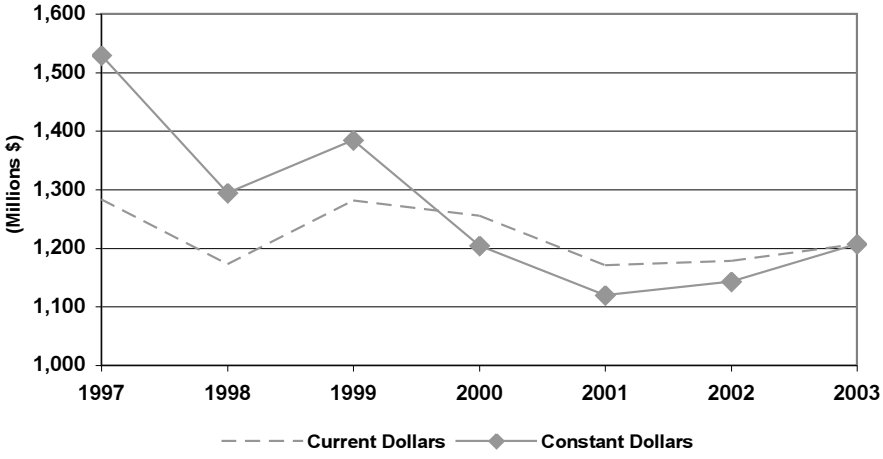


Source: USDC, BEA (2006b).
[a] Current 2003 dollars

Paper Manufacturing

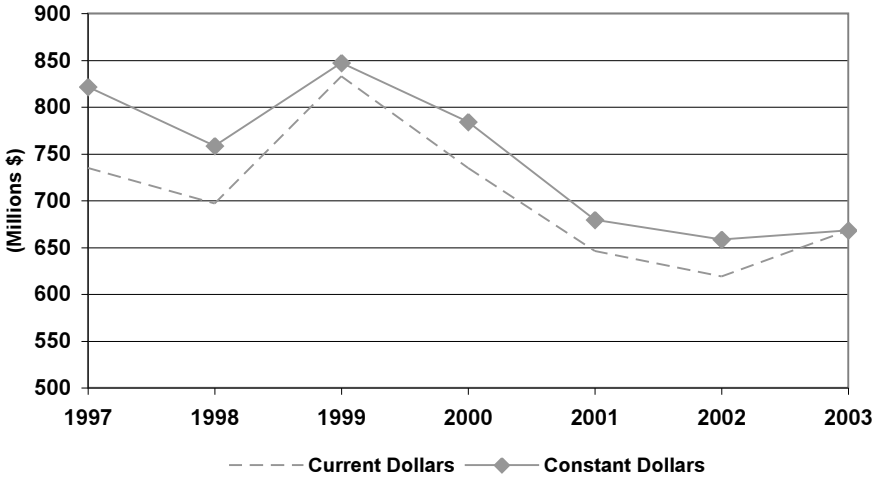
The paper manufacturing sector is consistently one of the three largest processing industries in Arkansas. In 1997, its GSP was $1.5B (Figure 11). However, pulp and paper manufacturers in North America were strongly affected by the Asian financial crisis during the mid-to-late 1990s (Simard, 1999), which continued to impact manufacturers through 2001. Figure 11 shows a substantial decline (15.4%) in the industry's value from 1997 to 1998 with a rebound of 7.0% the following year. From 1999 to 2001 the constant value of paper and allied products fell an additional 10%.

Figure 11. The gross state product of paper manufacturing, 1997-2003[a]



Source: USDC, BEA (2006b)
[a] Current and constant 2003 dollars

Figure 12. The gross state product of wood product manufacturing, 1997-2003[a]

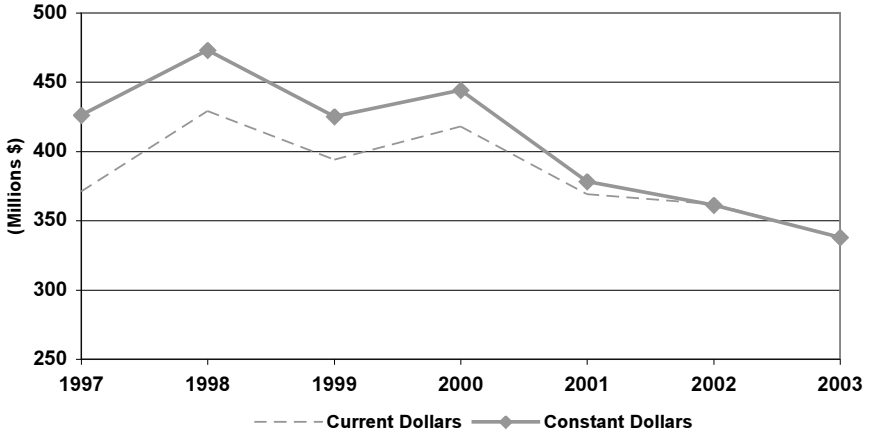


Source: USDC, BEA (2006b)
[a] Current and constant 2003 dollars

Wood Product Manufacturing

After a brief increase from 1998 to 1999, the GSP of wood product manufacturing plummeted 22.3% from 1999 to 2002 (Figure 12). As explained in detail in Popp et al. (2005), most of the decline in this industry was attributable to a slow-down in the international market for US wood chips and a drop in soft wood prices that followed an influx of Canadian wood on the market. This sector experienced a slight improvement in 2003 as the GSP for wood product manufacturing improved by 1.5% to almost $0.7B from 2002 to 2003.

Figure 13. The gross state product of furniture and related products manufacturing, 1997-2003[a]



Source: USDC, BEA (2006b)
[a] Current and constant 2003 dollars

Furniture and Related Products Manufacturing

During the period in which most agricultural processing sectors experienced a decline in GSP the furniture and related products manufacturing sector managed to increase its GSP 11% between 1997 and 1998 (Figure 13); this sector benefited from a strong resale housing market throughout the 1990s. The resale housing market is a leading indicator of demand for the furniture industry (Schuler, Taylor and Araman, 2001); however, as housing activity slowed in the late 1990s, lumber and furniture GSP also fell, as witnessed in a 24% decline from 2000 to 2003. Although the housing and real estate markets were gaining momen-

tum as of 2002, imports of furniture and other wood producers were also on the rise, flooding the market with less expensive substitutes for US manufactured products.

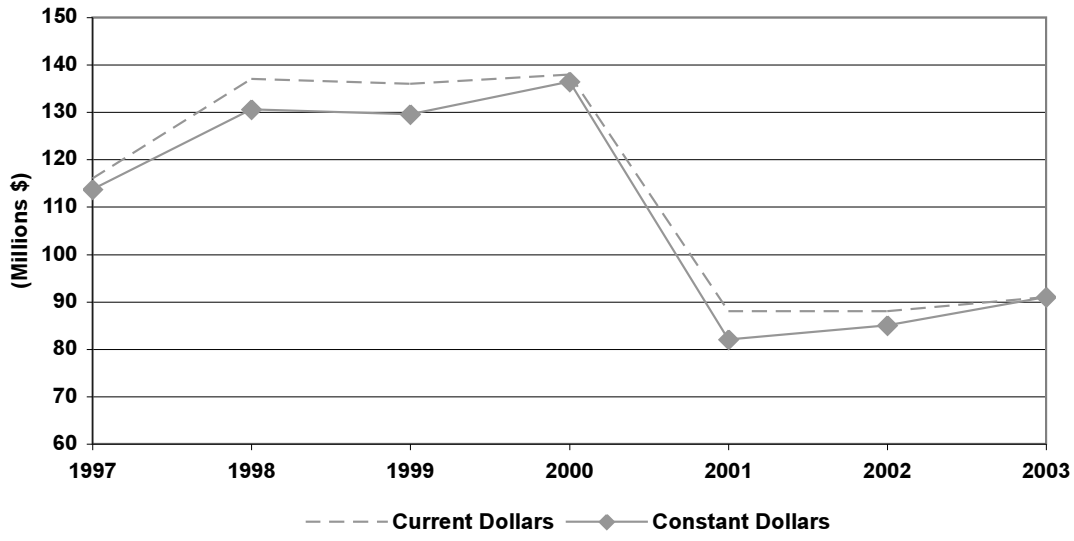
Textile and Textile Product Mills

From 1997 to 2000, the textile sector was growing rapidly (20%), but its GSP amounted to less than one percent of agricultural processing's GSP during this period (Figure 14). Several economic studies (USCC, 2002; USDA, FAS 2001; Wall, 2000) attribute the rise in value to the North American Free Trade Agreement (NAFTA). Although the overall effect of NAFTA on the US economy is controversial, many studies find that NAFTA has spurred demand for U.S. textiles in Mexico and Canada. However, the Arkansas textile and textile product mill industry experienced a steep decline between 2000 and 2001 after a major textile manufacturer closed its last plant in Arkansas in 2000. Since that closure, though, the industry has regained some of its lost value and increased its GSP by nearly 11% between 2001 and 2003.

Summary of the Trends in Gross State Product for Agriculture

In Goodwin et al. (2002) the agricultural sector was found to be a very strong part of the Arkansas economy. Popp et al. (2005) found that between 1999 and 2001, agriculture had lost share and value in nearly all of its production and processing areas, mainly due to depressed prices and lost market share. More recent data suggest that since 2001, much of the agricultural sector has rebounded. The crops production areas are benefiting from improved output and prices and much of the forestry sector is benefiting from improved housing starts and an active real estate market. Improved trade agreements have led to increased export sales, reduced poultry inventories, and increasing prices. Outbreaks of disease in major poultry producing and exporting countries, primarily in Southeast Asia, have further aided in the recovery of poultry prices. Increases in world prices for agricultural commodities have helped to maintain a strong and viable Agricultural Sector in the state.

Figure 14. The gross state product of textile and textile product mills, 1997-2003[a]



Source: USDC, BEA (2006b)

[a] Current and constant 2003 dollars

Direct, Indirect, and Induced Impacts of Agriculture

The economic impact of Arkansas' Agricultural Sector is much more than the direct impact of agricultural production and processing. To measure agriculture's total economic impact, the indirect and induced impacts of agriculture must also be taken into consideration. Indirect impacts occur when the Agricultural Sector purchases goods and services from local businesses. The production of certain farm machinery and equipment, for example, is an indirect impact of agricultural production. Agriculture's induced impacts are measured by increases in economic activity to satisfy the personal consumption by employees of the Agricultural Sector and by employees of firms that provide inputs to the Agricultural Sector. The sum of direct, indirect, and induced agricultural effects provides a measure for the total economic impact of agriculture.

Methods

As in Popp et al. (2005), the economic impacts of Arkansas' Agricultural Sector were modeled using the Impact Analysis for Planning (or IMPLAN) System (MIG, 2002), input-output modeling software. Impacts are reported in terms of employment, labor income, and value added. Employment includes all wage and salary employees, as well as self-employed jobs in a given sector. Labor income consists of two parts: first is proprietary income, which includes all income received by self-employed individuals including private business owners, doctors, lawyers, etc; second is wages, which includes all worker salaries, payments, and fringe benefits paid by employers. Value added represents all payments to workers (labor income) plus indirect taxes and other property-type income, such as payments for rents, royalties, and dividends. Value added is directly comparable to GSP and GDP; it is also generally the preferred measure of impact (Olson and Lindall, 2004). Direct, indirect, and induced impacts are reported for the Aggregate Agricultural Sector.

IMPLAN (and other software like it) can generate information relating to output. Measuring the economic importance of an industry using output can be misleading. Output represents the dollar value of an industry's total production, but can also be thought of as the sum of the goods and services used to provide a product. Economic impact analyses estimate impact of production (output) by including purchases from other industries to produce the inputs required to create this output; therefore, output includes the production of intermediate goods which are included in another industry's output. Summing the output of all industries would include multiple counting of some goods and services. Gross sales receipts overestimate the economic size of an industry because the values of inputs are recounted at each succeeding stage of production. Output should not be used as a measure of impact, and therefore is not reported here.

The impact analysis in this report represents a change in methodology from previous reports. Like many other industries in the state, agriculture in Arkansas has adapted to a changing world economy and accordingly the methods used to analyze the industry must also change accordingly. The researchers' primary goal in changing methodology reflects a commitment to continually improving the quality of the results reported in this research series. This report differs from Popp et al. (2005) in several ways. First, Popp et al. (2005) used the categories of Aggregate Agriculture, Crops, Livestock, and Forestry. Here, Livestock has been changed to the broader more representative term of Animal Agriculture. Second, Popp et al. (2005) reported the direct, indirect, and induced impacts of agriculture for four categories of agriculture: Crops, Animal Agriculture, Forestry, and Aggregate Agriculture. In this report, the direct, indirect and induced impacts are reported for the Aggregate Agriculture category only. For each of the three current sub-sectors of Crops, Animal Agriculture, and Forestry, direct impacts alone are reported. Third, in this report, the Agricultural Sector has been defined more narrowly than in previous reports. Although changes have occurred in the definitions of all four agricultural categories examined here, most were made within the Forestry Sector in order to be consistent with other Impact of Forestry studies in the south (Munn and Tilley, 2005). Fourth, all labor income and value added figures are reported in 2003 dollars here, where as they were reported in 2001 dollars in Popp et al. (2005). A comparison of the results of Popp et al. (2005) and those presented here appear to suggest that the impact of agriculture within the state has fallen between 2001 and 2003. However, results for 2001 and 2003 are not directly comparable due to changes in methodology. As noted in Part 1 of this report, agriculture's economic contribution to Arkansas' GSP increased between 2001 and 2003.

The economic impacts of agriculture were evaluated four ways: Crops Sector, Animal Agriculture Sector, Forestry Sector, and Aggregate Agriculture. For the first three sub sectors, agriculture is defined as those production and processing sectors in IMPLAN directly related to that category (Crops, Animal, or Forestry). The IMPLAN sectors used to create those categories are presented in Appendix B, Tables 1 to 3. Aggregate Agriculture is defined as the Crops, Animal Agriculture, and Forestry Sectors plus other agriculture-related sectors (presented in Appendix B, Table 4). Aggregate Agriculture was created using all of the sectors listed in Appendix B, Tables 1 through 4. In some cases, results are presented as production and processing impacts. The sectors that contributed to these impacts are listed in Appendix B, Tables 5 and 6. IMPLAN Arkansas data for year 2003, the most recent data available, were used to calculate all impacts (MIG, 2006). The relevant employment, labor income, and value added impacts of agriculture are detailed in Appendix C and are summarized below. All labor income and value added figures are reported in 2003 dollars, unless otherwise noted.

The Aggregate Agricultural Sector

In 2003, agriculture made large contributions to the economy in terms of employment, labor income, wages, and value added (see Box 1). The Aggregate Agricultural Sector provided 286,940 jobs, or 19.4%, of state employment (Table 2). That is, nearly one in five Arkansas jobs can be attributed to agriculture. In that same year, agriculture paid $8.9B, or 19% of state labor income. Wages accounted for 7.3B, or 82% of total labor income generated by agriculture. Additionally, the Aggregate Agricultural Sector added $15.3B of value to the state economy, or 20.3% of state value added. That is, more than $1 out of every $5 in value added can be attributed to agriculture. Details of these impacts are presented in Appendix C, Table 1 and are summarized in Tables 2 through 4 below.

Box 1. Total impact of Arkansas agriculture, 2003[a]
Employment 286,940 (nearly 1 out of 5 Arkansas jobs)
Wages $7.29B (17% of Arkansas wages)
Labor Income $8.94B (19% of Arkansas labor income)
Value-Added $15.28B (nearly $1 of every $5 of added value)

[a] Current dollars

Agriculture generates employment in all 20 of the 2-digit NAICS aggregated industries (or sectors). Three-quarters, or 76%, of all agriculture-generated jobs are in five industries (Box 2). The poultry sector (comprised of *Poultry Processing* and *Poultry and Eggs*) alone provides 44,960 jobs or almost 16% of all agricultural generated jobs in Arkansas. *Poultry Processing* employed 34,559 of these workers. The remaining 10,401 workers are employed in *Poultry and Egg Production*.

Box 2. Employment generated by agriculture, 2003 Top five NAICS industries[a]
Manufacturing 95,772 jobs (95% of the jobs are in agricultural processing)
Agriculture, Forestry, Fishing and Hunting 79,698 jobs (85% of the jobs are in agricultural production)
Retail Trade 15,738 jobs
Health and Social Services 14,390 jobs
Wholesale Trade 12,663 jobs
Top Five Total 218,260 jobs (76% of all jobs generated by Agriculture)

[a] Based on 2-Digit NAICS aggregation (USCB, 2006)

The far-reaching impacts of agriculture are seen in the distribution of agriculture-generated value added throughout the economy. Box 3 shows the five industries that benefit most from value added generated by agriculture. Note that three of those industries (Wholesale and Retail Trade, Transportation and Government and Non-NAICS) are outside of agriculture. In fact, almost half (45%) of all agriculture-generated value added accrues outside agricultural sectors. Within the agricultural sectors, *Poultry Processing, Poultry and Egg Production, Paper and Paper Board Mills, Logging,* and *Grain Farming* add the largest amount of value in the economy. About 20% ($3.1B) of value added by Agriculture accrues in Animal Agriculture, 18% ($2.9B) in Crops, and 17% ($2.60B) in Forestry.

Box 3. Value added generated by agriculture, 2003[a] Top five NAICS industries[b]
Manufacturing $5.95B (94% of the value added is in agricultural processing)
Agriculture, Forestry, Fishing and Hunting $3.11B (93% of the value added is in agricultural production)
Wholesale Trade $1.07B
Transportation and Warehousing $660.48M
Government and non NAICs $633.11M
Top Five Total $11.42B (75% of all value added generated by Agriculture)

[a] Current dollars
[b] Based on 2-Digit NAICS aggregation (USCB, 2006)

As with value added, much of the income attributable to agricultural activity is generated outside of agricultural sectors (Box 4). In 2003, $4.0B, or 45% of all labor income, went to workers in non-agricultural sectors. Within the agricultural sectors, *Poultry Processing, Poultry and Egg Production, Paper and Paper Board Mills, Agriculture and Forestry Support Services,* and *Oilseed Farming* employees received $2.4B, or 27 % of all labor income generated.

Agriculture's direct impact on the state economy is measured by the sum of the impacts of farm production and processing of farm products. There were 157,980 workers employed by the agricultural production and processing sec-

Table 2. The aggregate agricultural sector's impact on Arkansas' economy, 2003

	Employment [a]			Labor Income [b]			Value-Added [c]		
	Number of Jobs	% Total Impact	% Total Arkansas Jobs	Million $ [d]	% Total Impact	% Total Arkansas Labor Income	Million $	% Total Impact	% Total Arkansas Value Added
Production [e]	66,675	23.2	4.5	1,532	17.1	3.2	2,883	18.9	3.8
Processing [f]	91,305	31.8	6.2	3,403	38.0	7.1	5,621	36.8	7.5
Ag-Related [g]	13,301	4.6	0.9	290	3.2	0.6	238	1.6	0.3
Direct Impact	**171,281**	**59.7**	**11.6**	**5,225**	**58.4**	**10.8**	**8,742**	**57.2**	**11.6**
Indirect Effects	54,431	19.0	3.7	2,119	23.7	4.4	3,575	23.4	4.8
Direct + Indirect Impact	**225,712**	**78.7**	**15.3**	**7,344**	**82.1**	**15.2**	**12,317**	**80.6**	**16.4**
Induced Effects	61,227	21.3	4.1	1,600	17.9	3.3	2,959	19.4	3.9
Total Impact	**286,940**	**100.0**	**19.4**	**8,943**	**100.0**	**18.5**	**15,276**	**100.0**	**20.3**

Source: Computed using the 2003 Arkansas database from MIG (2006)

[a] Equivalent to full- and part-time jobs (MIG, 2000)

[b] Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2000)

[c] Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

[d] Current dollars

[e] Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

[f] Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

[g] Ag-related sectors include agricultural sectors not categorized as agricultural production or processing. These sectors are: Fishing, Hunting and Trapping, Agriculture and Forestry Support Activities, and New Farm Housing Units and Additions and Alterations

tors. The animal industries employed more than one out of every three (39%) of these workers (Tables 3 and 4), while the crops industries employed 37% and the forestry industries nearly 24%. These workers and owners of these farms and businesses received over $4.9B in labor income. Sixty-nine percent of the labor income went to workers and business owners in processing industries. Crops, Animal Agriculture, and Forestry Sectors directly added value of $8.7B to the Arkansas economy, nearly two thirds of which came from processing industries.

Box 4. Labor income generated by agriculture, 2003[a] Top five NAICS industries[b]
Manufacturing $3.61B (94% of labor income is in agricultural processing)
Agriculture, Forestry, Fishing and Hunting $1.81B (84% of labor income is in agricultural production)
Wholesale Trade $598.02M
Health and Social Services $490.80M
Transportation and Warehousing $469.09M
Top Five Total $6.98B 78 % of all labor income generated by Agriculture)

[a] Current dollars

[b] Based on 2-Digit NAICS aggregation (USCB, 2006)

Indirect impacts result when agricultural firms purchase raw materials and services from other Arkansas businesses to produce their products. In 2003, there were 54,431 workers employed by industries supplying goods and services to the farm production and processing industries. These workers and the owners of those establishments received $2.1B in labor income, and these industries added value of over $3.5B to the state economy.

Induced impacts result when employees of agricultural firms and employees of the raw material and service firms spend a portion of their income on local purchases. There were 61,227 workers employed by businesses providing goods and services to the employees in agriculture and its supplying industries. These employees and the proprietors of these businesses received over $1.60B in labor income and added value of roughly $2.96B to the Arkansas economy.

Table 3. The contribution of major agricultural sectors to agricultural production, 2003

	Employment [a]		Labor Income [b]		Value-Added [c]	
	(Number of Jobs)	(% Ag. Prod.)	(Million $) [d]	(% Ag. Prod.)	(Million $)	(% Ag. Prod.)
Crops	38,045	57.1	780	50.9	1,306	45.3
Animal Agriculture	22,431	33.6	520	34.0	1,077	37.4
Forestry	6,199	9.3	231	15.1	500	17.3
Total	**66,675**	**100.0**	**1,532**	**100.0**	**2,883**	**100.0**

Source: Computed using the 2003 Arkansas database from MIG (2006)

[a] Equivalent to full- and part-time jobs (MIG, 2000)

[b] Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2000).

[c] Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

[d] Current dollars

Table 4. The contribution of major agricultural sectors to agricultural processing, 2003

	Employment [a]		Labor Income [b]		Value-Added [c]	
	(Number of Jobs)	(% Ag. Proc.)	(Million $) [d]	(% Ag. Proc.)	(Million $)	(% Ag. Proc.)
Crops	20,412	22.4	807	23.7	1,544	27.5
Animal Agriculture	39,802	43.6	1,204	35.4	1,977	35.2
Forestry	31,092	34.1	1,391	40.9	2,100	37.4
Total	**91,305**	**100.0**	**3,403**	**100.0**	**5,621**	**100.0**

Source: Computed using the 2003 Arkansas database from MIG (2006)

[a] Equivalent to full- and part-time jobs (MIG, 2000)

[b] Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2000).

[c] Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

[d] Current dollars

The Crops Sector

The Crops Sector includes all enterprises engaged in the production and processing of cotton, food and feed grains, oil bearing crops, fruits, nuts and vegetables, and hay and pasture (Appendix B, Table 1). The Crops Sector's direct impact on the state economy is measured by the sum of the impacts of crop production and processing of crops products

Box 5. Direct impact of the crops sector, 2003[a]
Employment 58,456 jobs
Wages $ 0.91B
Labor Income $1.59B
Value Added $2.85B

[a] Current dollars

The Crops Sector generated 58,456 jobs within the sector, or 4% of state employment (Box 5,Table 5). The workers and business owners received $1.59B in labor income ($0.91B of that in wages), or 3.3% of state labor income as presented in Box 5. The Crops Sector added $2.85B, or 3.8% of state value-added. *Grain Farming, Oilseed Farming* and *Cotton Farming* together represented 60% of jobs, 43% of labor income, 11% of wages and 40% of value added in the Crops Sector (Box 6). Details are provided in Table 5 (below) and Appendix B, Table 2.

Box 6. Top crops production sectors: grain farming, oilseed farming, and cotton farming
60% of the jobs in the Crops Sector 11% of the wages in the Crops Sector 43% of the income in the Crops Sector 40% of the value added in the Crops Sector

Table 5. The crops sector's direct impact on Arkansas' economy, 2003

	Employment [a]			Labor Income [b]			Value-Added [c]		
	Number of Jobs	% Total Impact	% Total Arkansas Jobs	Million $ [d]	% Total Impact	% Total Arkansas Labor Income	Million $	% Total Impact	% Total Arkansas Value Added
Production [e]	38,045	65.1	2.6	780	49.1	1.6	1,306	45.8	1.7
Processing [f]	20,412	34.9	1.4	807	50.9	1.7	1,544	54.2	2.1
Direct Impact	**58,456**	**100.0**	**4.0**	**1,588**	**100.0**	**3.3**	**2,850**	**100.0**	**3.8**

Source: Computed using the 2003 Arkansas database from MIG (2006)

[a] Equivalent to full- and part-time jobs (MIG, 2000)

[b] Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2000)

[c] Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

[d] Current dollars

[e] Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

[f] Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

The Animal Agriculture Sector

The Animal Agriculture Sector, includes all enterprises engaged in the production and processing of animals, including poultry and egg, cattle, dairy farm, hogs and pigs, other animal agriculture, processed meat, and dairy processing industries (Appendix A, Table 3). The Animal Agriculture Sector's direct impact on the state economy is measured by the sum of the impacts of animal production and processing of animal products. This sector accounted for 62,233 jobs in 2003, or 4.2% of state employment, and these workers received $1.72B in labor income, or 3.6% of state labor income. In 2003, the Animal Agriculture Sector added $3.05B of value to the state economy, or 4.1% of state value-added (Box 7). Table 6 provides a summary of the Animal Agriculture Sector's total impact on Arkansas' economy; details can be found in Appendix B, Table 3. The *Poultry and Egg Production* and the *Poultry Processing* sectors provide 72% of jobs, 86% of income and 87% of value added in the Animal Agriculture Sector (Box 8).

Box 7. Direct impact of the animal agriculture sector, 2003[a]
Employment 62,233 jobs
Wages $1.38B
Labor Income $1.72B
Value Added $3.05B

[a] Current dollars

Box 8. The poultry industry (poultry and egg production and poultry processing) contributes[a]:
44,960 Jobs (1 in 6 Agriculture jobs)
$1.14B in Wages (almost 16 percent of Agriculture wages)
$1.48B in Labor Income (over $1 in $6 of Agriculture labor income)
$2.67B in Value Added ($1 in $6 of Agriculture value added)
72% of Animal Agriculture Jobs, 82% of Wages, 86% of Income and 87% of Value Added are in the Poultry Industry

[a] Current dollars

Table 6. The Animal Agriculture sector's direct impact on Arkansas' economy, 2003

	Employment [a]			Labor Income [b]			Value-Added [c]		
	Number of Jobs	% Total Impact	% Total Arkansas Jobs	Million $ [d]	% Total Impact	% Total Arkansas Labor Income	Million $	% Total Impact	% Total Arkansas Value Added
Production [e]	22,431	36.0	1.5	520	30.2	1.1	1,077	35.3	1.4
Processing [f]	39,802	64.0	2.7	1,204	69.8	2.5	1,977	64.7	2.6
Direct Impact	**62,233**	**100.0**	**4.2**	**1,724**	**100.0**	**3.6**	**3,054**	**100.0**	**4.1**

Source: Computed using the 2003 Arkansas database from MIG (2006)

[a] Equivalent to full- and part-time jobs (MIG, 2000).

[b] Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2000)

[c] Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

[d] Current dollars

[e] Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

[f] Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

The Forestry Sector

The Forestry Sector is primarily comprised of forest products, furniture and wood and paper processing enterprises (Appendix A, Table 2). The Forestry Sector's direct impact on the state economy is measured by the sum of the impacts of timber production and processing. There were 37,291 jobs (2.5% of state employment) in the Forestry Sector in 2003, and these workers and business owners received $1.62B in labor income, or 3.4% of state labor income. The Forestry Sector added $2.60B of value to the state economy, or 3.5% of total state value-added (Box 9). Within this sector, *Sawmills, Logging,* and *Paper and Paperboard Mills* comprise 44% of forestry jobs, and almost half of forestry income and value added (Box 10). Details can be found in Appendix B, Table 4. These impacts are summarized in Table 7.

Box 9. Direct impact of the forestry sector, 2003[a]
Employment 37,291 jobs
Wages $ 1.51B
Labor Income $1.62B
Value Added $2.60B

[a] Current dollars

Box 10. Top three forestry sectors sawmills, logging, and paper and paperboard mills contribute:
16,270 Jobs (44 % of all forestry jobs)
$ 0.71B in Wages ($1 in $2 of Forestry wages)
$0.80B in Labor Income (almost half of Forestry labor income)
$1.42B in Value Added ($1 in $2 of Forestry value added)

[a] Current dollars

Table 7. The forestry sector's direct impact on Arkansas' economy, 2003

	Employment [a]			Labor Income [b]			Value-Added [c]		
	Number of Jobs	% Total Impact	% Total Arkansas Jobs	Million $ [d]	% Total Impact	% Total Arkansas Labor Income	Million $	% Total Impact	% Total Arkansas Value Added
Production [e]	6,199	16.6	0.4	231	14.3	0.5	500	19.2	0.7
Processing [f]	31,092	83.4	2.1	1,391	85.7	2.9	2,100	80.8	2.8
Direct Impact	**37,291**	**100.0**	**2.5**	**1,623**	**100.0**	**3.4**	**2,600**	**100.0**	**3.5**

Source: Computed using the 2003 Arkansas database from MIG (2006)

[a] Equivalent to full- and part-time jobs (MIG, 2000).

[b] Labor income represents all forms of employment income; it is the sum of employee compensation and proprietor income (MIG, 2000)

[c] Value-added is the sum of employee compensation, proprietary income, and indirect business taxes

[d] Current dollars

[e] Appendix A, Table 3 lists sectors of direct agricultural production in terms of IMPLAN sectors

[f] Appendix A, Table 3 lists sectors of direct agricultural processing in terms of IMPLAN sectors

Summary

Data from the Bureau of Economic Analysis indicates that Arkansas' Agricultural Sector continues to contribute a larger share of GSP to the state's economy than does agriculture in other states of the southeastern US. According to 2003 IMPLAN data and subsequent analyses, about one dollar in five of the total state value added and employment can be attributed to agriculture. One in six dollars of labor income can be attributed to agriculture as well.

After a period of rapid growth in the 1980s, the GSP attributable to agriculture in Arkansas stabilized at around $8B in the mid 1990s. About the year 2000, agriculture's share of GSP began a slow decline that has continued through 2003. Much of that decline through 2001 was attributed to loss of value due to price pressures for agricultural commodities and an oversupply of processed agricultural goods relative to demand.

More recent data for 2002 and 2003 suggest that many of the declines in agricultural prices have reversed and that output is expanding and that impact of agriculture may well reach historical highs. World and domestic price stability and associated agricultural and food policies will continue to have a significant impact on Arkansas agriculture and its contribution to the Arkansas economy. Continued strength of agriculture is of paramount importance if the social and economic fabric of rural Arkansas communities is to be retained and if the essential infrastructure and services that translate into an acceptable quality of life for its residents are to be maintained.

End Notes

[1] Gross State Product (GSP) and IMPLAN data for Arkansas are for the year 2003. The value of production data from USDA, ERS, and USDA NASS used in Figures 7 & 8 extends through 2004.

[2] Throughout this report, all numerical references to agricultural trends are calculated using constant dollars. The use of constant dollars factors in the effects of inflation and other economic fluctuations on price and allows for a value comparison over time. Constant dollars are derived from the Bureau of Economic Analysis' (BEA's) 2000 chained-dollar series, adjusted to a base year of 2003. The BEA uses industry-specific deflators to adjust current dollars to constant dollars.

[3] The SIC system was based upon what was produced, and it paid particular attention to manufacturing industries, as was appropriate for the economy of the 1930s. The service sector of the economy has since developed in inconceivable ways. Unlike SIC, NAICS is designed to focus on how products and services are created resulting in major differences in industry groupings. Reconstructing time series data is difficult since many industries are grouped in different or entirely new categories. Like SIC, NAICS categorizes data into one of two domains: goods producing or service providing. These domains are further divided into 12 super sectors and then broken into 20 industry sectors designated by two digits, compared with the eleven alphabetically designated divisions of SIC. Some of the super sectors appear to be similar to the SIC industry divisions, but different industries are grouped in these categories. Many sectors are entirely new and are composed primarily of industries previously classified under the old SIC services division. Because of its increased number of sectors, NAICS allows for greater precision in data assignment and analyses.

[4] GSP is a measurement of economic activity in the state economy. GSP is a similar measure to value-added as defined by MIG, or the sum of employee compensation, proprietary income (e.g., rent payments), and indirect business taxes (e.g., sales taxes paid by individuals to firms). GSP is also equivalent to gross output minus the cost of intermediate output.

[5] The BEA defines agricultural production as Agriculture, Forestry, and Fisheries. They define agricultural processing as Lumber and Wood; Furniture and Fixtures; Food and Kindred Products; Tobacco Products; Textile Mill Products; Paper Products in the processing

[6] The BEA includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia in the Southeast region.

[7] GDP is the national equivalent to GSP.

[8] Due to the greater detail of NAICS industries, some processing sectors that were included in SIC industries considered agriculture are now reclassified under NAICS industries not considered agricultural processing. Thus, it appears that the value of GSP has fallen in recent years. The correct interpretation of this change is that it is now possible to more accurately define agriculture.

[9] One important change in recent years occurred in the poultry production sector where large productivity gains have been experienced. The amount of labor required to produce the same output on poultry farms has decreased

and the majority of poultry output is increasingly produced on fewer acres. This is reflected in the employment number associated with poultry production in this report which has decreased dramatically since the 2001 report. The reason for such a drop reflects productivity gains occurring over the past 10 or more years that were only recently adjusted for in the IMPLAN data set.

[10] Appendix C provides the total impacts for the Aggregate Agricultural Sector and the direct impacts for the Crops, Animal Agriculture, and Forestry Sectors.

[11] This figure differs from that reported by BEA. This is to be expected because both the sources of data for value added and GSP are different, and "agriculture" is defined differently by BEA and by this study, which is based on the IMPLAN sector definitions.

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Appendix A
SIC & NAICS Classification Related to Agricultural Manufacturing

Table 1. Comparison of SIC and NAICS manufacturing components

Industry	1997 SIC Description	1997 NAICS Description
WOOD PRODUCT MANUFACTURING	Logging was part of wood product manufacturing	Logging is now a part of ag production; portion of the old sector 3131 Boot and Shoe Cut Stock and Findings (wood heels) is now included
FURNITURE AND RELATED PRODUCTS MANUFACTURING	Sector used to contain value that are now a part of sector 33636 Motor Vehicle Seating and Interior Trim Manufacturing (pt) and 339111 Laboratory Apparatus and Furniture Manufacturing (pt)	This industry now contains the full value of what was classified by SIC as 2434 Wood Kitchen Cabinets; *5712 Furniture Stores (custom wood cabinets); *5712 Furniture (custom made upholstered household furniture except cabinets); *3952 Lead Pencils, Crayons, and Artist's Materials (drafting tables and boards); *3999 Manufacturing Industries, NEC (beauty and barber chairs); *3089 Plastics Products, NEC (finished plastics furniture parts); *3429 Hardware, NEC (convertible bed sleeper mechanisms, chair glides); *3499 Fabricated Metal Products, NEC (metal furniture frames)
FOOD MANUFACTURING		This industry now is defined with whole and portions of sectors that either did not exist in the SIC industries or was elsewhere classified or both. This industry now contains Tobacco products manufacturing; now includes a portion of what used to be *0723 Crop Production Services for Market, Except Cotton Ginning (custom grain grinding); *5441 Candy, Nut, and Confectionery Stores (chocolate candy stores, preparing on premises); *0751 Livestock Services, Except Veterinary (custom slaughtering); *5147 Meat and Meat Products (boxed beef); *5461 Retail Bakeries (bread, cake and related products baked and sold on premise).

Table 1. (Continued)

Industry	1997 SIC Description	1997 NAICS Description
TOBACCO PRODUCTS		Now a part of food products
TEXTILE AND TEXTILES PRODUCT MILLS	This used to contain: 315111 Sheer Hosiery Mills (pt); 315119 Other Hosiery and Sock Mills ; 315192 Underwear and Nightwear Knitting Mills (pt); 315191 Outerwear Knitting Mills (pt);	315 Apparel Manufacturing and 316 Leather and Allied Product Manufacturing are now combined into one sector, "Apparel Manufacturing"; this now contains portions of the following sectors: *5131 Piece Goods and Notions (broadwoven piece good converters); *7389 Business Services, NEC (sponging fabric for tailors and dressmakers); *3069 Fabricated Rubber Products, NEC (rubberizing fabric or purchased textile products);*5714 Drapery, Curtain, and Upholstery Stores (custom drapes); *5714 Drapery, Curtain, and Upholstery Stores (custom slipcovers); *3569 General Industrial Machinery and Equipment, NEC (textile fire hose); *7389 Business Services, NEC (embroidery of advertising on shirts and rug binding for the trade).
PAPER MANUFACTURING	Contained sector 326112 Unsupported Plastics Packaging Film and Sheet Manufacturing; 326111 Unsupported Plastics Bag Manufacturing	Now a portion of what used to be "Fabricated Metal Products" sector 3497 Metal Foil and Leaf (laminated aluminum foil rolls and sheets for flexible packaging uses) is part of Paper Manufacturing

Appendix B
Description of IMPLAN Sectors and Aggregation Schemes

Table 1. Major components of the crops sector as defined by IMPLAN sectors, 2003

Aggregate Sector	Sector ID	IMPLAN Sector
	1	Oilseed farming
	2	Grain farming
	3	Vegetable and melon farming
	4	Tree nut farming
CROPS PRODUCTION	5	Fruit farming
	6	Greenhouse and nursery production
	7	Tobacco farming
	8	Cotton farming
	9	Sugarcane and sugar beet farming
	10	All other crop farming
	48	Flour milling
	49	Rice milling
	50	Malt manufacturing
	51	Wet corn milling
	52	Soybean processing
	53	Other oilseed processing
	54	Fats and oils refining and blending
	55	Breakfast cereal manufacturing
	56	Sugar manufacturing
	57	Confectionery manufacturing from cacao beans
	58	Confectionery manufacturing from purchased chocolate
	59	Nonchocolate confectionery manufacturing
	60	Frozen food manufacturing
	61	Fruit and vegetable canning and drying
	72	Frozen cakes and other pastries manufacturing
	73	Bread and bakery product- except frozen- manufacturing
	74	Cookie and cracker manufacturing
	75	Mixes and dough made from purchased flour
	76	Dry pasta manufacturing
	77	Tortilla manufacturing
	78	Roasted nuts and peanut butter manufacturing
	79	Other snack food manufacturing
	80	Coffee and tea manufacturing
	81	Flavoring syrup and concentrate manufacturing
CROPS PROCESSING	82	Mayonnaise- dressing- and sauce manufacturing
	83	Spice and extract manufacturing
	84	All other food manufacturing
	85	Soft drink and ice manufacturing
	86	Breweries
	87	Wineries
	88	Distilleries
	89	Tobacco stemming and redrying
	90	Cigarette manufacturing
	91	Other tobacco product manufacturing
	92	Fiber- yarn- and thread mills
	93	Broadwoven fabric mills
	94	Narrow fabric mills and schiffli embroidery
	95	Nonwoven fabric mills
	96	Knit fabric mills
	97	Textile and fabric finishing mills

Table 1. (Continued)

Aggregate Sector	Sector ID	IMPLAN Sector
	98	Fabric coating mills
	99	Carpet and rug mills
	100	Curtain and linen mills
	101	Textile bag and canvas mills
CROPS PROCESSING	102	Tire cord and tire fabric mills
	103	Other miscellaneous textile product mills
	104	Sheer hosiery mills
	105	Other hosiery and sock mills
	106	Other apparel knitting mills
	107	Cut and sew apparel manufacturing
	108	Accessories and other apparel manufacturing

Table 2. Major components of the animal agriculture sector, defined by IMPLAN sectors, 2003

Aggregated Sector	Sector ID	IMPLAN Sector
	11	Cattle ranching and farming
ANIMAL PRODUCTION	12	Poultry and egg production
	13	Animal production- except cattle and poultry and egg
	46	Dog and cat food manufacturing
	47	Other animal food manufacturing
	62	Fluid milk manufacturing
	63	Creamery butter manufacturing
	64	Cheese manufacturing
	65	Dry- condensed- and evaporated dairy products
ANIMAL PROCESSING	66	Ice cream and frozen dessert manufacturing
	67	Animal- except poultry- slaughtering
	68	Meat processed from carcasses
	69	Rendering and meat byproduct processing
	70	Poultry processing
	71	Seafood product preparation and packaging

Table 3. Major components of the forestry sector as defined by IMPLAN sectors, 2003

Aggregated Sector	Sector ID	IMPLAN Sector
FORESTRY PRODUCTION	14	Logging
	15	Forest nurseries- forest products- and timber tracks
FORESTRY PROCESSING	112	Sawmills
	113	Wood preservation
	114	Reconstituted wood product manufacturing
	115	Veneer and plywood manufacturing
	116	Engineered wood member and truss manufacturing
	117	Wood windows and door manufacturing
	118	Cut stock- resawing lumber- and planing
	119	Other millwork- including flooring
	120	Wood container and pallet manufacturing
	122	Prefabricated wood building manufacturing
	123	Miscellaneous wood product manufacturing
	124	Pulp mills
	125	Paper and paperboard mills
	126	Paperboard container manufacturing
	128	Surface-coated paperboard manufactuing
	129	Coated and laminated paper and packaging materials
	130	Coated and uncoated paper bag manufacturing
	131	Die-cut paper office supplies manufacturing
	132	Envelope manufacturing
	133	Stationery and related product manufacturing
	134	Sanitary paper product manufacturing
	135	All other converted paper product manufacturing
	362	Wood kitchen cabinet and countertop manufacturing
	363	Upholstered household furniture manufacturing
	364	Nonupholstered wood household furniture manufactur
	368	Wood office furniture manufacturing
	369	Custom architectural woodwork and millwork

Table 4. Major components of the agriculture related sector as defined by IMPLAN sectors, 2003

Aggregated Sector	Sector ID	IMPLAN Sector
AGRICULTURE RELATED	16	Fishing
	17	Hunting and trapping
	18	Agriculture and forestry support activities
	36	New farm housing units and additions and alterations

Table 5. Major components of agricultural production and agriculture related as defined by IMPLAN sectors

Aggregated Sector	IMPLAN Sector
CROPS PRODUCTION	Oilseed farming; Grain farming; Vegetable and melon farming; Tree nut farming; Fruit farming; Greenhouse and nursery production; Tobacco farming; Cotton farming; Sugarcane and sugar beet farming; All other crop farming
ANIMAL PRODUCTION	Cattle ranching and farming; Poultry and egg production; Animal production- except cattle and poultry and egg
FORESTRY PRODUCTION	Forest nurseries- forest products- and timber track; Logging
AGRICULTURE RELATED	Fishing; Hunting and trapping; Agriculture and forestry support activities; New farm housing units and additions and alterations

Table 6. Major components of agricultural processing as defined by IMPLAN sectors

Aggregate Sector	IMPLAN Sector
CROPS PROCESSING	Flour milling; Rice milling; Malt manufacturing; Wet corn milling; Soybean processing; Other oilseed processing; Fats and oils refining and blending; Breakfast cereal manufacturing; Sugar manufacturing; Confectionery manufacturing from cacao beans; Confectionery manufacturing from purchased chocolate; Nonchocolate confectionery manufacturing; Frozen food manufacturing; Fruit and vegetable canning and drying; Frozen cakes and other pastries manufacturing; Bread and bakery product- except frozen- manufacturing; Cookie and cracker manufacturing; Mixes and dough made from purchased flour; Dry pasta manufacturing; Tortilla manufacturing; Roasted nuts and peanut butter manufacturing; Other snack food manufacturing; Coffee and tea manufacturing; Flavoring syrup and concentrate manufacturing; Mayonnaise- dressing- and sauce manufacturing; Spice and extract manufacturing; All other food manufacturing; Soft drink and ice manufacturing; Breweries; Wineries; Distilleries; Tobacco stemming and redrying; Cigarette manufacturing; Other tobacco product manufacturing; Fiber- yarn- and thread mills; Broadwoven fabric mills; Narrow fabric mills and schiffli embroidery; Nonwoven fabric mills; Knit fabric mills; Textile and fabric finishing mills; Fabric coating mills; Carpet and rug mills; Curtain and linen mills; Textile bag and canvas mills; Tire cor
ANIMAL PROCESSING	Dog and cat food manufacturing; Other animal food manufacturing; Fluid milk manufacturing; Creamery butter manufacturing; Cheese manufacturing; Dry- condensed- and evaporated dairy products; Ice cream and frozen dessert manufacturing; Animal- except poultry- slaughtering; Meat processed from carcasses; Rendering and meat byproduct processing; Poultry processing; Seafood product preparation and packaging
FORESTRY PROCESSING	Sawmills; Wood preservation; Reconstituted wood product manufacturing; Veneer and plywood manufacturing; Engineered wood member and truss manufacturing; Wood windows and door manufacturing; Cut stock- resawing lumber- and planning; Other millwork- including flooring; Wood container and pallet manufacturing; Prefabricated wood building manufacturing; Miscellaneous wood product manufacturing; Pulp mills; Paper and paperboard mills; Paperboard container manufacturing; Surface-coated paperboard manufacturing; Coated and laminated paper and packaging materials; Coated and uncoated paper bag manufacturing; Die-cut paper office supplies manufacturing; Envelope manufacturing; Stationery and related product manufacturing; Sanitary paper product manufacturing; All other converted paper product manufacturing; Wood kitchen cabinet and countertop manufacturing; Upholstered household furniture manufacturing; Non-upholstered wood household furniture manufacturing; Wood office furniture manufacturing; Custom architectural woodwork and millwork

Appendix C
Agriculture-Generated Activity by Sector

Table 1. Agriculture-generated activity by sector, 2003[1]

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
70	Poultry processing	34,559	999	1,680
2	Grain farming	18,126	255	403
390	Wholesale trade	12,663	598	1,067
18	Agriculture and forestry support activities	12,104	279	217
1	Oilseed farming	10,706	275	398
12	Poultry and egg production	10,401	482	993
481	Food services and drinking places	10,097	126	176
394	Truck transportation	6,436	231	311
13	Animal production- except cattle and poultry and egg	6,329	14	32
8	Cotton farming	5,940	152	329
112	Sawmills	5,865	216	330
11	Cattle ranching and farming	5,701	25	52
14	Logging	5,667	207	405
60	Frozen food manufacturing	5,131	184	367
125	Paper and paperboard mills	4,738	379	680
431	Real estate	4,682	72	317
465	Offices of physicians- dentists- and other health	3,572	212	256
451	Management of companies and enterprises	3,536	257	335
126	Paperboard container manufacturing	3,383	164	187
467	Hospitals	3,378	131	135
483	Automotive repair and maintenance- except car wash	3,354	74	102
73	Bread and bakery product- except frozen- manufacturing	2,963	115	182
454	Employment services	2,743	36	37
410	General merchandise stores	2,667	54	90
468	Nursing and residential care facilities	2,483	54	62
115	Veneer and plywood manufacturing	2,447	101	122
405	Food and beverage stores	2,346	45	70
400	Warehousing and storage	2,292	77	113
401	Motor vehicle and parts dealers	2,162	80	124
119	Other millwork- including flooring	2,156	70	78
494	Private households	2,073	17	17
430	Monetary authorities and depository credit interme	1,933	79	230
10	All other crop farming	1,925	47	92
130	Coated and uncoated paper bag manufacturing	1,896	84	103
470	Social assistance- except child day care services	1,891	31	32
411	Miscellaneous store retailers	1,770	22	30
134	Sanitary paper product manufacturing	1,693	98	216
43	Maintenance and repair of nonresidential buildings	1,621	45	50
49	Rice milling	1,567	64	108
61	Fruit and vegetable canning and drying	1,525	74	156
364	Nonupholstered wood household furniture manufactur	1,507	40	50
68	Meat processed from carcasses	1,491	58	74
120	Wood container and pallet manufacturing	1,363	34	45
363	Upholstered household furniture manufacturing	1,341	46	48
47	Other animal food manufacturing	1,265	58	76
362	Wood kitchen cabinet and countertop manufacturing	1,247	37	46
437	Legal services	1,229	52	67
412	Nonstore retailers	1,193	11	24

Table 1. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
479	Hotels and motels- including casino hotels	1,173	19	34
469	Child day care services	1,129	13	20
404	Building material and garden supply stores	1,088	29	48
499	Other State and local government enterprises	1,076	50	57
30	Power generation and supply	1,072	93	319
85	Soft drink and ice manufacturing	1,058	57	98
407	Gasoline stations	1,047	19	30
408	Clothing and clothing accessories stores	1,038	16	27
438	Accounting and bookkeeping services	1,010	32	34
107	Cut and sew apparel manufacturing	1,010	22	45
426	Securities- commodity contracts- investments	1,000	40	43
102	Tire cord and tire fabric mills	960	50	67
485	Commercial machinery repair and maintenance	948	25	37
458	Services to buildings and dwellings	921	14	18
392	Rail transportation	898	72	129
67	Animal- except poultry- slaughtering	884	27	30
427	Insurance carriers	846	36	44
406	Health and personal care stores	846	20	32
449	Veterinary services	838	16	18
455	Business support services	750	13	17
493	Civic- social- professional and similar organizati	744	18	18
6	Greenhouse and nursery production	723	31	51
399	Couriers and messengers	689	20	30
17	Hunting and trapping	686	2	3
113	Wood preservation	676	23	26
439	Architectural and engineering services	668	28	29
118	Cut stock- resawing lumber- and planing	657	20	24
79	Other snack food manufacturing	653	32	94
78	Roasted nuts and peanut butter manufacturing	644	26	60
491	Religious organizations	637	12	12
461	Elementary and secondary schools	634	9	9
409	Sporting goods- hobby- book and music stores	628	9	14
425	Nondepository credit intermediation and related a	619	32	60
466	Other ambulatory health care services	605	23	26
478	Other amusement- gambling- and recreation industri	604	9	17
489	Drycleaning and laundry services	588	9	12
462	Colleges- universities- and junior colleges	585	14	14
177	Plastics plumbing fixtures and all other plastics	583	19	32
69	Rendering and meat byproduct processing	563	23	57
402	Furniture and home furnishings stores	560	14	24
104	Sheer hosiery mills	556	16	22
397	Scenic and sightseeing transportation and support	551	27	32
114	Reconstituted wood product manufacturing	550	28	69
15	Forest nurseries- forest products- and timber trac	532	24	95
172	Plastics packaging materials- film and sheet	532	27	54
476	Fitness and recreational sports centers	530	7	9
484	Electronic equipment repair and maintenance	523	16	22
422	Telecommunications	520	45	110

Table 1. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
487	Personal care services	488	6	9
464	Home health care services	475	13	15
450	All other miscellaneous professional and technical	473	9	51
446	Scientific research and development services	457	18	19
457	Investigation and security services	454	8	9
444	Management consulting services	443	21	23
398	Postal service	439	28	27
52	Soybean processing	438	20	30
19	Oil and gas extraction	422	27	80
62	Fluid milk manufacturing	419	19	24
403	Electronics and appliance stores	393	10	15
123	Miscellaneous wood product manufacturing	393	10	14
45	Other maintenance and repair construction	386	11	12
116	Engineered wood member and truss manufacturing	385	12	19
106	Other apparel knitting mills	376	10	12
75	Mixes and dough made from purchased flour	372	20	44
472	Spectator sports	354	6	7
463	Other educational services	340	6	7
428	Insurance agencies- brokerages- and related	337	12	26
108	Accessories and other apparel manufacturing	331	8	11
5	Fruit farming	329	4	7
139	Commercial printing	309	12	14
77	Tortilla manufacturing	308	9	13
460	Waste management and remediation services	305	12	19
486	Household goods repair and maintenance	303	6	13
350	Motor vehicle parts manufacturing	292	13	14
447	Advertising and related services	290	11	12
95	Nonwoven fabric mills	289	16	23
36	New farm housing units and additions and alteratio	278	8	15
413	Newpaper publishers	273	13	16
129	Coated and laminated paper and packaging materials	264	13	21
435	General and consumer goods rental except video tap	262	9	15
3	Vegetable and melon farming	262	15	24
432	Automotive equipment rental and leasing	259	8	17
471	Performing arts companies	251	3	3
99	Carpet and rug mills	244	9	15
16	Fishing	234	2	2
488	Death care services	228	5	7
71	Seafood product preparation and packaging	228	5	7
482	Car washes	226	2	4
459	Other support services	212	5	10
54	Fats and oils refining and blending	211	9	17
243	Machine shops	205	8	8
433	Video tape and disc rental	198	2	5
31	Natural gas distribution	198	13	30
474	Promoters of performing arts and sports and agents	198	2	5
490	Other personal services	197	4	9
420	Radio and television broadcasting	186	11	12

Table 1. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
66	Ice cream and frozen dessert manufacturing	181	7	15
74	Cookie and cracker manufacturing	178	7	17
88	Distilleries	177	14	85
84	All other food manufacturing	174	5	6
442	Computer systems design services	169	10	9
72	Frozen cakes and other pastries manufacturing	168	6	8
395	Transit and ground passenger transportation	167	2	3
492	Grantmaking and giving and social advocacy organiz	167	4	4
103	Other miscellaneous textile product mills	164	4	4
312	All other electronic component manufacturing	148	6	6
173	Plastics pipe- fittings- and profile shapes	148	6	11
135	All other converted paper product manufacturing	141	6	9
452	Office administrative services	141	6	9
498	State and local government electric utilities	136	9	19
418	Motion picture and video industries	132	4	5
101	Textile bag and canvas mills	128	4	4
131	Die-cut paper office supplies manufacturing	128	3	4
53	Other oilseed processing	126	6	10
240	Metal can- box- and other container manufacturing	121	5	8
117	Wood windows and door manufacturing	118	3	4
178	Foam product manufacturing	114	4	9
391	Air transportation	114	5	8
150	Other basic inorganic chemical manufacturing	110	9	15
429	Funds- trusts- and other financial vehicles	109	2	2
443	Other computer related services- including facilit	108	8	12
46	Dog and cat food manufacturing	108	4	8
171	Other miscellaneous chemical product manufacturing	108	7	9
83	Spice and extract manufacturing	106	3	8
189	Glass container manufacturing	106	5	8
480	Other accommodations	102	2	3
424	Data processing services	102	10	13
434	Machinery and equipment rental and leasing	99	5	5
32	Water- sewage and other systems	99	4	7
82	Mayonnaise- dressing- and sauce manufacturing	98	2	5
497	State and local government passenger transit	98	5	1
368	Wood office furniture manufacturing	96	3	3
100	Curtain and linen mills	94	2	4
64	Cheese manufacturing	91	3	4
416	Database- directory- and other publishers	83	5	11
42	Maintenance and repair of farm and nonfarm residen	82	2	4
440	Specialized design services	80	2	3
142	Petroleum refineries	77	9	15
496	Other Federal Government enterprises	76	3	5
456	Travel arrangement and reservation services	75	2	2
169	Custom compounding of purchased resins	74	6	7
396	Pipeline transportation	69	7	7
371	Showcases- partitions- shelving- and lockers	68	3	3
448	Photographic services	67	2	2

Table 1. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
151	Other basic organic chemical manufacturing	63	6	8
375	Surgical and medical instrument manufacturing	60	3	4
48	Flour milling	57	1	3
473	Independent artists- writers- and performers	56	1	2
190	Glass and glass products- except glass containers	54	2	3
441	Custom computer programming services	53	3	3
93	Broadwoven fabric mills	52	2	2
477	Bowling centers	52	1	1
445	Environmental and other technical consulting servi	51	2	3
257	Farm machinery and equipment manufacturing	51	2	3
334	Motor and generator manufacturing	48	2	4
159	Pesticide and other agricultural chemical manufact	45	3	12
166	Toilet preparation manufacturing	45	3	8
379	Dental laboratories	43	2	2
369	Custom architectural woodwork and millwork	42	1	1
97	Textile and fabric finishing mills	42	1	1
87	Wineries	41	2	4
59	Nonchocolate confectionery manufacturing	40	1	2
283	Cutting tool and machine tool accessory manufactur	39	2	2
378	Ophthalmic goods manufacturing	39	1	2
58	Confectionery manufacturing from purchased chocola	39	1	2
51	Wet corn milling	39	2	5
167	Printing ink manufacturing	38	2	3
229	Hand and edge tool manufacturing	36	1	2
247	Electroplating- anodizing- and coloring metal	36	1	2
175	Plastics bottle manufacturing	35	1	3
28	Support activities for oil and gas operations	34	2	3
4	Tree nut farming	34	1	2
156	Nitrogenous fertilizer manufacturing	32	2	4
241	Hardware manufacturing	31	1	2
475	Museums- historical sites- zoos- and parks	29	4	2
181	Other rubber product manufacturing	29	1	2
309	Audio and video equipment manufacturing	29	1	1
242	Spring and wire product manufacturing	26	1	1
145	Petroleum lubricating oil and grease manufacturing	25	2	3
248	Metal valve manufacturing	25	1	2
294	Industrial truck- trailer- and stacker manufacturi	24	1	1
110	Footwear manufacturing	23	1	1
414	Periodical publishers	23	1	2
158	Fertilizer- mixing only- manufacturing	21	1	2
264	Paper industry machinery manufacturing	20	1	1
111	Other leather product manufacturing	18	1	2
86	Breweries	18	1	5
258	Lawn and garden equipment manufacturing	18	0	1
321	Watch- clock- and other measuring and controlling	17	1	1
436	Lessors of nonfinancial intangible assets	17	2	16
384	Sign manufacturing	17	1	1
372	Mattress manufacturing	17	0	1

Table 1. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
421	Cable networks and program distribution	16	1	5
346	Motor vehicle body manufacturing	15	1	1
282	Special tool- die- jig- and fixture manufacturing	15	1	1
65	Dry- condensed- and evaporated dairy products	14	1	2
333	Electric power and specialty transformer manufactu	14	1	1
244	Turned product and screw- nut- and bolt manufactur	14	1	1
423	Information services	14	1	1
323	Audio and video media reproduction	14	1	1
377	Dental equipment and supplies manufacturing	12	0	1
98	Fabric coating mills	12	2	4
160	Pharmaceutical and medicine manufacturing	12	1	2
163	Soap and other detergent manufacturing	12	1	1
192	Ready-mix concrete manufacturing	12	0	1
246	Metal coating and nonprecious engraving	11	0	1
295	Power-driven handtool manufacturing	11	0	1
25	Sand- gravel- clay- and refractory mining	11	1	1
148	Industrial gas manufacturing	11	1	2
144	Asphalt shingle and coating materials manufacturin	11	1	2
297	Packaging machinery manufacturing	11	0	1
26	Other nonmetallic mineral mining	10	1	1
174	Laminated plastics plate- sheet- and shapes	10	0	1
20	Coal mining	10	1	2
330	Household refrigerator and home freezer manufactur	10	0	0
349	Travel trailer and camper manufacturing	10	0	0
337	Storage battery manufacturing	9	1	1
80	Coffee and tea manufacturing	9	0	0
81	Flavoring syrup and concentrate manufacturing	9	0	2
203	Iron and steel mills	9	1	1
273	Other commercial and service industry machinery ma	9	0	0
344	Automobile and light truck manufacturing	8	1	1
376	Surgical appliance and supplies manufacturing	8	0	1
235	Metal window and door manufacturing	8	0	1
205	Iron- steel pipe and tube from purchased steel	8	0	1
389	Buttons- pins- and all other miscellaneous manufac	7	0	0
207	Steel wire drawing	7	0	1
136	Manifold business forms printing	7	0	1
341	Wiring device manufacturing	7	0	1
208	Alumina refining	7	1	1
141	Prepress services	6	0	0
365	Metal household furniture manufacturing	6	0	0
292	Conveyor and conveying equipment manufacturing	6	0	0
316	Industrial process variable instruments	5	0	0
358	Boat building	5	0	0
143	Asphalt paving mixture and block manufacturing	5	0	0
236	Sheet metal work manufacturing	5	0	0
122	Prefabricated wood building manufacturing	5	0	0
76	Dry pasta manufacturing	5	0	0
152	Plastics material and resin manufacturing	5	0	1

Table 1. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
149	Synthetic dye and pigment manufacturing	5	0	0
245	Metal heat treating	5	0	0
415	Book publishers	5	0	0
336	Relay and industrial control manufacturing	4	0	0
233	Fabricated structural metal manufacturing	4	0	0
180	Rubber and plastics hose and belting manufacturing	4	0	0
137	Books printing	4	0	0
55	Breakfast cereal manufacturing	4	0	0
211	Aluminum sheet- plate- and foil manufacturing	4	0	0
306	Telephone apparatus manufacturing	4	0	0
228	Cutlery and flatware- except precious- manufacturi	3	0	0
269	All other industrial machinery manufacturing	3	0	0
286	Other engine equipment manufacturing	3	0	0
164	Polish and other sanitation good manufacturing	3	0	0
252	Fabricated pipe and pipe fitting manufacturing	3	0	0
274	Automatic vending- commercial laundry and dryclean	3	0	0
340	Other communication and energy wire manufacturing	3	0	0
419	Sound recording industries	3	0	1
317	Totalizing fluid meters and counting devices	3	0	0
351	Aircraft manufacturing	3	0	0
335	Switchgear and switchboard apparatus manufacturing	3	0	0
227	All other forging and stamping	3	0	0
343	Miscellaneous electrical equipment manufacturing	3	0	0
453	Facilities support services	3	0	0
267	Food product machinery manufacturing	3	0	0
342	Carbon and graphite product manufacturing	3	0	0
170	Photographic film and chemical manufacturing	2	0	0
352	Aircraft engine and engine parts manufacturing	2	0	0
212	Aluminum extruded product manufacturing	2	0	0
331	Household laundry equipment manufacturing	2	0	0
373	Blind and shade manufacturing	2	0	0
222	Aluminum foundries	2	0	0
254	Enameled iron and metal sanitary ware manufacturin	2	0	0
296	Welding and soldering equipment manufacturing	2	0	0
234	Plate work manufacturing	2	0	0
262	Sawmill and woodworking machinery	2	0	0
263	Plastics and rubber industry machinery	2	0	0
265	Textile machinery manufacturing	2	0	0
417	Software publishers	2	0	0
198	Abrasive product manufacturing	2	0	0
147	Petrochemical manufacturing	2	0	0
259	Construction machinery manufacturing	2	0	0
271	Optical instrument and lens manufacturing	1	0	0
124	Gold- silver- and other metal ore mining	1	0	0
23	Pulp mills	1	0	0
366	Institutional furniture manufacturing	1	0	0
24	Stone mining and quarrying	1	0	0
232	Prefabricated metal buildings and components	1	0	0

Table 1. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
311	Semiconductors and related device manufacturing	1	0	0
140	Tradebinding and related work	1	0	0
195	Other concrete product manufacturing	1	0	0
287	Speed changers and mechanical power transmission e	1	0	0
356	Railroad rolling stock manufacturing	1	0	0
367	Other household and institutional furniture	1	0	0
27	Drilling oil and gas wells	1	0	0
223	Nonferrous foundries- except aluminum	1	0	0
314	Search- detection- and navigation instruments	1	0	0
353	Other aircraft parts and equipment	1	0	0
260	Mining machinery and equipment manufacturing	1	0	0
307	Broadcast and wireless communications equipment	1	0	0
387	Broom- brush- and mop manufacturing	1	0	0
213	Other aluminum rolling and drawing	1	0	0
313	Electromedical apparatus manufacturing	1	0	0
162	Adhesive manufacturing	1	0	0
279	Industrial mold manufacturing	1	0	0
301	Scales- balances- and miscellaneous general purpos	1	0	0
302	Electronic computer manufacturing	1	0	0
305	Other computer peripheral equipment manufacturing	1	0	0
161	Paint and coating manufacturing	0	0	0
185	Brick and structural clay tile manufacturing	0	0	0
255	Miscellaneous fabricated metal product manufacturi	0	0	0
293	Overhead cranes- hoists- and monorail systems	0	0	0
370	Office furniture- except wood- manufacturing	0	0	0
381	Sporting and athletic goods manufacturing	0	0	0
385	Gasket- packing- and sealing device manufacturing	0	0	0
393	Water transportation	0	0	0
138	Blankbook and looseleaf binder manufacturing	0	0	0
168	Explosives manufacturing	0	0	0
194	Concrete pipe manufacturing	0	0	0
216	Copper rolling- drawing- and extruding	0	0	0
217	Copper wire- except mechanical- drawing	0	0	0
237	Ornamental and architectural metal work manufactur	0	0	0
266	Printing machinery and equipment manufacturing	0	0	0
280	Metal cutting machine tool manufacturing	0	0	0
281	Metal forming machine tool manufacturing	0	0	0
299	Fluid power cylinder and actuator manufacturing	0	0	0
315	Automatic environmental control manufacturing	0	0	0
322	Software reproducing	0	0	0
383	Office supplies- except paper- manufacturing	0	0	0
210	Secondary smelting and alloying of aluminum	0	0	0
219	Nonferrous metal- except copper and aluminum- shap	0	0	0
238	Power boiler and heat exchanger manufacturing	0	0	0
288	Pump and pumping equipment manufacturing	0	0	0
155	Noncellulosic organic fiber manufacturing	0	0	0
179	Tire manufacturing	0	0	0
184	Porcelain electrical supply manufacturing	0	0	0

Table 1. (Continued)

Sector ID	Aggregate Agriculture Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
197	Gypsum product manufacturing	0	0	0
201	Mineral wool manufacturing	0	0	0
202	Miscellaneous nonmetallic mineral products	0	0	0
221	Ferrous metal foundaries	0	0	0
224	Iron and steel forging	0	0	0
239	Metal tank- heavy gauge- manufacturing	0	0	0
261	Oil and gas field machinery and equipment	0	0	0
284	Rolling mill and other metalworking machinery	0	0	0
285	Turbine and turbine generator set units manufactur	0	0	0
289	Air and gas compressor manufacturing	0	0	0
291	Elevator and moving stairway manufacturing	0	0	0
303	Computer storage device manufacturing	0	0	0
327	Electric housewares and household fan manufacturin	0	0	0
328	Household vacuum cleaner manufacturing	0	0	0
347	Truck trailer manufacturing	0	0	0
361	All other transportation equipment manufacturing	0	0	0
374	Laboratory apparatus and furniture manufacturing	0	0	0
380	Jewelry and silverware manufacturing	0	0	0
7	Owner-occupied dwellings	0	0	551
Total		**286,939**	**8,943**	**15,276**

[1] Sorted by total number of jobs descending

Table 2. Crop impacts by sector, 2003[1]

Sector ID	Crops Sector Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
2	Grain farming	18,126.40	254.613	402.844
1	Oilseed farming	10,706.30	274.550	397.955
8	Cotton farming	5,939.70	152.459	329.418
60	Frozen food manufacturing	5,130.90	184.290	366.769
73	Bread and bakery product- except frozen- manufacturing	2,962.90	115.354	181.744
10	All other crop farming	1,924.80	46.674	92.259
49	Rice milling	1,567.00	63.893	107.710
61	Fruit and vegetable canning and drying	1,524.50	74.405	156.379
85	Soft drink and ice manufacturing	1,058.20	56.994	97.735
107	Cut and sew apparel manufacturing	1,009.70	22.127	44.576
102	Tire cord and tire fabric mills	960	50.362	67.150
6	Greenhouse and nursery production	723.1	31.194	50.958
79	Other snack food manufacturing	653.2	31.587	93.637
78	Roasted nuts and peanut butter manufacturing	644.3	26.441	60.378
104	Sheer hosiery mills	555.7	16.164	22.464
52	Soybean processing	437.6	19.696	29.835
106	Other apparel knitting mills	376.2	9.655	11.921
75	Mixes and dough made from purchased flour	371.5	19.911	43.612
108	Accessories and other apparel manufacturing	331.1	7.593	11.246
5	Fruit farming	328.8	4.069	6.752
77	Tortilla manufacturing	308.3	8.685	13.030
95	Nonwoven fabric mills	289	16.290	23.334
3	Vegetable and melon farming	261.8	15.358	24.325
99	Carpet and rug mills	243.8	8.626	15.492
54	Fats and oils refining and blending	211	8.772	16.729
74	Cookie and cracker manufacturing	178	6.953	17.116
88	Distilleries	176.9	13.596	84.887
84	All other food manufacturing	173.6	4.529	6.303
72	Frozen cakes and other pastries manufacturing	167.9	5.810	7.744
103	Other miscellaneous textile product mills	163.8	3.575	3.912
101	Textile bag and canvas mills	128.3	3.744	3.920
53	Other oilseed processing	126.1	5.994	10.048
83	Spice and extract manufacturing	105.8	2.833	7.609
82	Mayonnaise- dressing- and sauce manufacturing	97.9	2.209	4.899
100	Curtain and linen mills	93.5	2.345	3.577
48	Flour milling	56.7	1.450	2.667
93	Broadwoven fabric mills	52.1	1.956	2.139
97	Textile and fabric finishing mills	41.8	0.740	0.785
87	Wineries	40.9	2.339	4.207
59	Nonchocolate confectionery manufacturing	39.7	0.992	2.092
58	Confectionery manufacturing from purchased chocola	38.7	0.818	2.024
51	Wet corn milling	38.5	2.182	5.047
4	Tree nut farming	33.6	1.353	1.892
86	Breweries	18	1.395	5.214
98	Fabric coating mills	12.1	2.358	3.528
80	Coffee and tea manufacturing	9	0.187	0.258
81	Flavoring syrup and concentrate manufacturing	9	0.413	1.897
76	Dry pasta manufacturing	4.8	0.108	0.286

Table 2. (Continued)

Sector ID	Crops Sector Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
55	Breakfast cereal manufacturing	3.6	0.063	0.105
7	Tobacco farming	0	0.000	0.000
9	Sugarcane and sugar beet farming	0	0.000	0.000
50	Malt manufacturing	0	0.000	0.000
56	Sugar manufacturing	0	0.000	0.000
57	Confectionery manufacturing from cacao beans	0	0.000	0.000
89	Tobacco stemming and redrying	0	0.000	0.000
90	Cigarette manufacturing	0	0.000	0.000
91	Other tobacco product manufacturing	0	0.000	0.000
92	Fiber- yarn- and thread mills	0	0.000	0.000
94	Narrow fabric mills and schiffli embroidery	0	0.000	0.000
96	Knit fabric mills	0	0.000	0.000
105	Other hosiery and sock mills	0	0.000	0.000
Total		**58,456**	**1587.704**	**2850.406**

[1] Sorted by total number of jobs descending

Table 3. Animal agriculture impacts by sector, 2003[1]

Sector ID	Animal Agriculture Sector Contribution to:	Employment (Jobs)	Income (Million $)	Value Added ($ Million)
70	Poultry processing	34,559	999	1,680
12	Poultry and egg production	10,401	482	993
13	Animal production- except cattle, poultry, eggs	6,329	14	32
11	Cattle ranching and farming	5,701	25	52
68	Meat processed from carcasses	1,491	58	74
47	Other animal food manufacturing	1,265	58	76
67	Animal- except poultry- slaughtering	884	27	30
69	Rendering and meat byproduct processing	563	23	57
62	Fluid milk manufacturing	419	19	24
71	Seafood product preparation and packaging	228	5	7
66	Ice cream and frozen dessert manufacturing	181	7	15
46	Dog and cat food manufacturing	108	4	8
64	Cheese manufacturing	91	3	4
65	Dry- condensed- and evaporated dairy products	14	1	2
63	Creamery butter manufacturing	0	0	0
Total		**62,233**	**1,724**	**3,054**

[1] Sorted by total number of jobs descending

Table 4. Forestry impacts by sector, 2003[1]

Sector ID	Forestry Sector Contribution to:	Employment (Jobs)	Income (Million $)	Added ($ Million)
112	Sawmills	5,865	216	330
14	Logging	5,667	207	405
125	Paper and paperboard mills	4,738	379	680
126	Paperboard container manufacturing	3,383	164	187
115	Veneer and plywood manufacturing	2,447	101	122
119	Other millwork- including flooring	2,156	70	78
130	Coated and uncoated paper bag manufacturing	1,896	84	103
134	Sanitary paper product manufacturing	1,693	98	216
364	Nonupholstered wood household furniture manufactur	1,507	40	50
120	Wood container and pallet manufacturing	1,363	34	45
363	Upholstered household furniture manufacturing	1,341	46	48
362	Wood kitchen cabinet and countertop manufacturing	1,247	37	46
113	Wood preservation	676	23	26
118	Cut stock- resawing lumber- and planing	657	20	24
114	Reconstituted wood product manufacturing	550	28	69
15	Forest nurseries- forest products- and timber trac	532	24	95
123	Miscellaneous wood product manufacturing	393	10	14
116	Engineered wood member and truss manufacturing	385	12	19
129	Coated and laminated paper and packaging materials	264	13	21
135	All other converted paper product manufacturing	141	6	9
131	Die-cut paper office supplies manufacturing	128	3	4
117	Wood windows and door manufacturing	118	3	4
368	Wood office furniture manufacturing	96	3	3
369	Custom architectural woodwork and millwork	42	1	1
122	Prefabricated wood building manufacturing	5	0	0
124	Pulp mills	1	0	0
128	Surface-coated paperboard manufactuing	0	0	0
132	Envelope manufacturing	0	0	0
133	Stationery and related product manufacturing	0	0	0
Total		**37,291**	**1,623**	**2,600**

[1] Sorted by total number of jobs descending


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