

The Importance of Agriculture for Kentucky

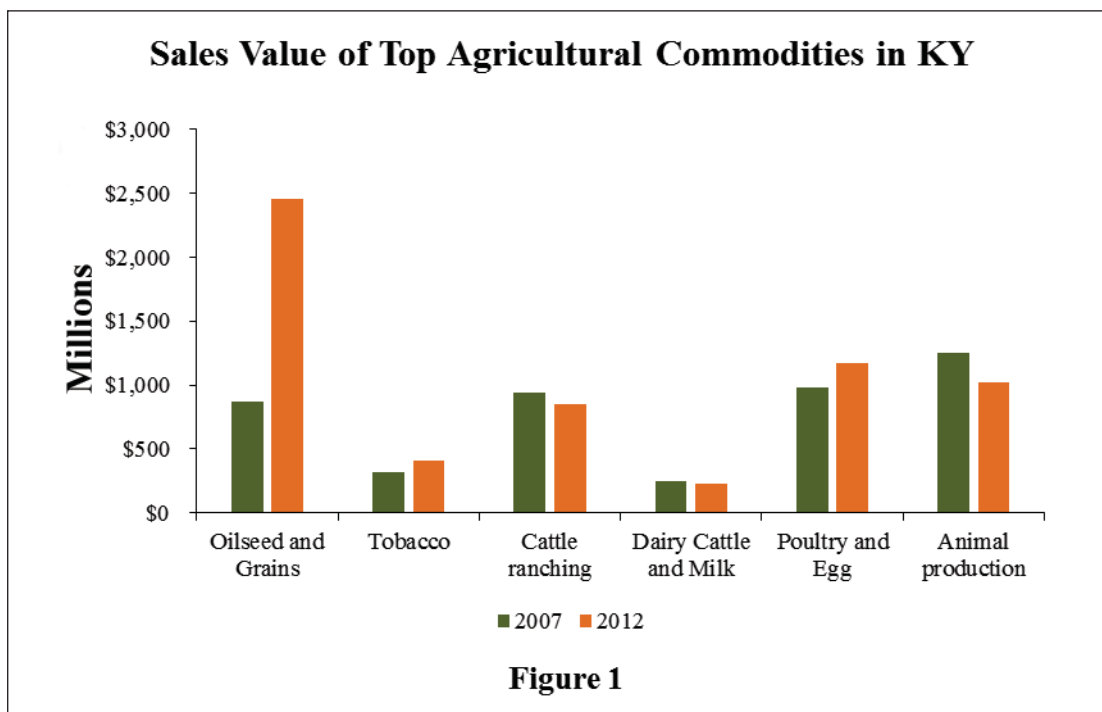
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The total economic impact of agriculture in Kentucky in 2013 equaled \$45.6 billion, representing an 8.3% increase from the economic impact of \$42.1 billion in 2007.

Over the past five years, the total number of farms in Kentucky has fallen from 85,260 operations in 2007 to 77,064 operations in 2012. However, over the same time period, the average market value of agricultural products per operation increased from \$56,586 to \$65,755 and farm-related income per operation has increased from \$10,395 to \$17,409. In addition, total acres of Kentucky farmland decreased by roughly 6.7% to 13,049,347 in 2012 but acres per farm increased by 3% to 169 in 2012 over the last five years.¹ Overall, this indicates that loss of value from decreasing number of farms has been partially off set by gains to farms that have stayed operational. Figure 1 provides an overview of the change in the value of sales of top commodities produced in the state.



To determine the value of agriculture in Kentucky, an Input-Output (IO) model is constructed with 2013 IMPLAN data. This model allows the use of multipliers, which give an indication of the impact of an industry on employment, output, and income in the local economy. Multipliers measure the total change throughout the economy from a one unit change for a given sector. The model utilizes the Type II multiplier, which is most widely used in IO analysis. A Type II multiplier includes the effect of direct (initial) spending, indirect spending (transactions between businesses), and induced (household) spending. Essentially, induced effects depict employees' spending on goods and services.

Table 1 provides an overview of the market value for agricultural products in Kentucky. Industries have been divided into three sectors: agricultural production, agricultural processing, and agriculture-related

¹ Census of Agriculture 2007 & 2012

industries. Agricultural production and processing sectors include all industries that directly conduct agricultural activities. The production sector involves the production of intermediate goods that need to be processed before consumption. The processing sector includes goods that utilize crops and livestock as inputs, for example frozen vegetable production.

The agriculture-related industries sector is comprised of industries that either provide inputs to the primary sector or use agricultural products as manufacturing inputs. It consists of apparel, leather, and agricultural inputs industries. Note that the economic impact of the leather and apparel industries cannot be completely attributed to agricultural activities. While it is not possible to disaggregate the economic impact of agricultural activities from the total economic impact of leather and apparel, agricultural activities likely constitute a substantial portion of the value-added of apparel and leather industries. Finally, agricultural inputs include inputs to agricultural production or processing, such as fertilizer and farm equipment.

In 2013, total revenue for production agriculture was \$7.35 billion and total employment equaled 95,642 workers. The agricultural processing sector generated output worth approximately \$23.2 billion and employed 37,210 workers. Total output for the entire agriculture industry topped \$31.3 billion and employment totaled 135,797 workers. Agricultural output was about 7.9% of total revenue in Kentucky.

Table 2 provides the output, employment and value-added multipliers for the three sectors mentioned above: agricultural production, agricultural processing, and agriculture-related industries. The employment multiplier is defined as the number of new jobs created from hiring an additional employee in the agricultural sector. The output multiplier depicts the “turnover” of the dollar or the additional dollars generated from every dollar increase in sales. The labor-income multiplier describes the additional labor income generated from every dollar of direct labor income earned.

For example, consider the textiles industry. The employment multiplier is equal to 1.53. This number suggests that for every 100 new jobs in the textile industry, through direct, indirect, and induced effects, additional 53 jobs are created throughout the rest of the local economy. The output multiplier is equal to 1.43. This means that for every dollar spent in the production of textiles, an additional 43 cents is generated as a result of interactions between business, suppliers, and household spending. The income multiplier is equal to 1.55. For every \$1 of income generated, an additional 55 cents of income is generated within the local economy. It is important to note that the indirect and induced effects are not constrained to the agricultural industry. Depending on the relationships between different industries and household spending, spillover effects can be felt in any industry within the local economy.

Table 3 provides the final estimate of the overall economic impact of agriculture on the state of Kentucky. Including the multiplier effect, production agriculture represents approximately **\$9.5 billion of output, 128,855 jobs and just short of \$889 million in labor income**. Including other agriculture-related industries, agriculture is responsible for **\$45.6 billion of output, 258,605 jobs and \$6.2 billion in labor income**.

Table 1. Direct Effect of Agriculture on Kentucky's Economy in 2013

Industry	Employment	Output*	Value-Added*
Agricultural Production:			
<i>Oilseed and Grains</i>	13,488	\$2,460,556	\$20,154
<i>Vegetables and Melons</i>	33	\$1,714	\$190
<i>Fruits and Tree Nuts</i>	388	\$8,886	\$1,423
<i>Greenhouse, Nursery, & Floriculture</i>	2,905	\$92,330	\$17,654
<i>Tobacco</i>	995	\$405,474	\$79,501
<i>All other crop farming</i>	19,178	\$691,692	\$104,347
<i>Cattle ranching</i>	7,659	\$848,306	\$12,252
<i>Dairy Cattle and Milk</i>	3,776	\$231,340	\$8,394
<i>Poultry and Egg</i>	9,408	\$1,171,104	\$49,386
<i>Animal production (including Equine)</i>	27,214	\$1,016,070	\$57,363
<i>Commercial Fishing</i>	54	\$2,484	\$204
<i>Support Activities</i>	10,544	\$424,809	\$245,220
TOTAL	95,642	\$7,354,766	\$596,089
Agricultural Processing:			
<i>Food and Beverage processing</i>	33,684	\$20,612,258	\$1,930,948
<i>Tobacco products</i>	1,007	\$2,148,202	\$65,983
<i>Textiles</i>	2,520	\$408,262	\$103,944
TOTAL	37,210	\$23,168,722	\$2,100,874
Apparel	1,828	\$211,546	\$67,910
Leather	288	\$35,550	\$6,075
Agricultural Inputs	828	\$585,047	\$40,819
Total for Agriculture	135,797	\$31.3 Billion	\$2.8 Billion
Total for All Industries	2,425,747	\$398 Billion	\$101 Billion
Agriculture's Share of All Industries	5.6%	7.9%	2.8%

*Thousands of Dollars

Table 2. Economic Multipliers for Agricultural Industries in Kentucky, 2013			
Industry	Employment	Output	Labor-Income
Agricultural Production:			
<i>Oilseed and Grains²</i>	1.96	1.44	2.11
<i>Vegetables and Melons</i>	1.17	8.09	1.38
<i>Fruits and Tree Nuts</i>	1.09	0.38	1.40
<i>Greenhouse, Nursery, & Floriculture</i>	1.13	0.99	1.37
<i>Tobacco</i>	2.87	1.09	1.51
<i>All other crop farming</i>	1.17	0.21	1.57
<i>Cattle ranching</i>	1.62	1.43	2.27
<i>Dairy Cattle and Milk</i>	1.27	1.48	1.87
<i>Poultry and Egg</i>	1.42	1.54	2.06
<i>Animal production (including Equine)</i>	1.10	1.22	1.34
<i>Commercial Fishing</i>	1.18	1.16	1.53
<i>Support Activities</i>	1.20	1.58	1.28
Agricultural Processing:			
<i>Food and Beverage Processing</i>	3.41	1.52	2.38
<i>Tobacco products</i>	5.42	1.42	4.70
<i>Textiles</i>	1.53	1.43	1.55
Apparel	1.56	1.61	1.60
Leather	1.57	1.64	1.99
Agricultural Inputs	2.71	1.37	2.64

2 Due to inconsistencies in 2013 IMPLAN data for this particular industry, we use the 2010 multiplier to measure the economic impact. The 2010 multiplier is understated relative to the 2013 multiplier and likely provides a lower bound for the economic impact of the Oilseeds and Grains industry.

Table 3. Total Effect of Agriculture on Kentucky's Economy in 2013			
Industry	Employment	Output*	Labor-Income*
Agricultural Production:			
<i>Oilseed and Grains</i>	26,440	\$3,541,771	\$42,484
<i>Vegetables and Melons</i>	39	\$13,867	\$262
<i>Fruits and Tree Nuts</i>	424	\$3,355	\$1,989
<i>Greenhouse, Nursery, & Floriculture</i>	3,283	\$91,278	\$24,162
<i>Tobacco</i>	2,859	\$442,122	\$119,749
<i>All other crop farming</i>	22,459	\$148,304	\$164,098
<i>Cattle ranching</i>	12,428	\$1,210,702	\$27,823
<i>Dairy Cattle and Milk</i>	4,788	\$343,182	\$15,668
<i>Poultry and Egg</i>	13,349	\$1,802,900	\$101,920
<i>Animal production (including Equine)</i>	30,061	\$1,239,506	\$77,112
<i>Commercial Fishing</i>	63	\$2,875	\$312
<i>Support Activities</i>	12,663	\$671,730	\$313,213
TOTAL	128,855	\$9,511,592	\$888,791
Agricultural Processing:			
<i>Food and Beverage Processing</i>	114,877	\$31,296,358	\$4,586,198
<i>Tobacco products</i>	5,458	\$3,039,965	\$310,416
<i>Textiles</i>	3,863	\$583,736	\$160,872
TOTAL	124,199	\$34,920,058	\$5,057,486
Apparel	2,855	\$340,388	\$108,624
Leather	451	\$58,474	\$12,112
Agricultural Inputs	2,246	\$802,538	\$107,596
Total for Agriculture	258,605	\$45.6 Billion	\$6.2 Billion

*Thousands of Dollars





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