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Economic Contribution of Agriculture to the New Jersey Economy



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Executive Summary

With 9,883 farms and 734,084 acres in farmland, agriculture is a key part of New Jersey's economy and landscape. Economic impact analysis revealed the following:

- New Jersey agriculture generated $2.1 billion in economic impact and supported more than 31,231 jobs.
- New Jersey agriculture generated approximately $96.1 million in tax revenue for state and local tax jurisdictions in 2017.
- Nursery and greenhouse production was the largest sector, generating $950 million in economic impact and supporting 10,266 jobs.
- New Jersey produces a tremendous amount of fresh fruits and vegetables. Altogether, these sectors produced $726.1 million in economic impact and supporting 18,572 jobs.
- Cumberland County generated the largest economic impact: producing $403.7 million in economic impact.
- Atlantic County generated $233.3 million in economic impact.

Introduction

This publication is intended to inform policy making and industry leadership by measuring the composition, size, and economic significance of New Jersey's agriculture industry. The impact on the State economy is quantified using measures of land use (acreage), direct gross output (sales), and employment (workers), as well as by assessing the economic linkages between the agricultural sector and other supporting industries. The first section of this report provides a basic profile of New Jersey agriculture using data from the 2017 Census of Agriculture. Next, estimates of the total economic contribution of New Jersey's agriculture are presented, including the multiplier effects from businesses and household spending of workers in agriculture and related sectors.

Methods

The contribution of New Jersey agriculture to the state economy extends beyond the commodities directly produced on farms. Certain industries provide critical support for agricultural production, basing their own economic activity on New Jersey agriculture. These agricultural service and supply industries (e.g., pest management consultants, fertilizer manufacturers, farm equipment manufacturers, etc.) provide jobs and wages for local residents, contributing to the overall economic activity of the State. Wages paid by agricultural producers are also spent and re-spent throughout the economy. Economic impact analysis is based on the premise that a regional economy is built upon these inter-industry dependencies and that economic activity in one industry has ripple effects that move throughout the entire economic system. Economic impact analysis was conducted using IMPLAN[1] to model and quantify the linkages extending from the State's agriculture industry.

Profile of New Jersey Agriculture

According to the most recent (2017) Census of Agriculture, New Jersey had 9,883 farms[2]. Table 1 shows the number of farms in New Jersey by farm type[3]. The most prevalent agricultural operations in New Jersey specialize in Other Crop farming. While the NAICS definition is useful in identifying the number of operations specializing in a commodity, it does not provide a complete description of New Jersey agriculture.

[1] IMPLAN Group, LLC. IMPLAN 2018. Huntersville, NC. IMPLAN.com.

[2] The census definition of a farm is any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year.

[3] As defined by the North American Industry Classification System (NAICS). NAICS classification identifies businesses by the product which constitutes the majority of that business' total sales.

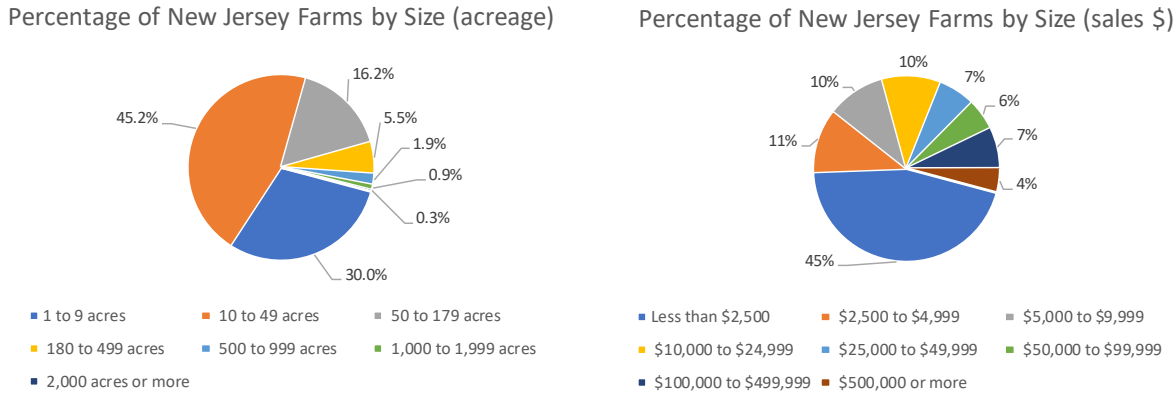
Table 1. Number of New Jersey Farms by Type

Type of Farm (NAICS code)	Number of Farms
Oilseed and grain farming (1111)	810
Vegetable and melon farming (1112)	895
Fruit and tree nut farming (1113)	586
Greenhouse, nursery, and floriculture (1114)	1,540
Other crop farming (1119)	2,143
Beef cattle ranching and farming (112111)	726
Cattle feedlots (112112)	9
Dairy cattle and milk production (11212)	57
Hog and pig farming (1122)	58
Poultry and egg production (1123)	286
Sheep and goat farming (1124)	753
Aquaculture and other animal (1125, 1129)	2,020

Source: 2017 Census of Agriculture, USDA, National Agricultural Statistics Service

As seen in Figure 1, approximately 76% of New Jersey farms have sales less than $25,000 annually, and over 45% of farms have sales less than $2,500. By contrast, approximately 4% of New Jersey farms have annual sales of $500 million or more. Thus, a relatively small number of New Jersey operations account for the lion's share of agricultural sales in the State.

Figure 1. Percentage of New Jersey Farms by Acreage and Sales



Source: 2017 Census of Agriculture, USDA, National Agricultural Statistics Service

Further demonstrating that the value of production is concentrated in a relatively small number of large farms, Table 2 shows select statistics of New Jersey farms by concentration of market value of agricultural products sold. Approximately 4% of farms had agriculture sales of more than $824 million representing 75% of the total value of agricultural products sold in the State. The average farm size for those 383 farms was 576 acres and the average sales per farm was $2.2 million. By contrast, the average farm size for all farms in New Jersey was 74 acres, and the average and sales per farm was $111,095.

Table 2. New Jersey Farms by Concentration of Agricultural Sales

		Fewest number of farms accounting for			
Item	All Farms	10 percent of sales	25 percent of sales	50 percent of sales	75 percent of sales
Farms	9,883	4	18	104	383
Percent of farms	100.0%	< 0.05%	0.2%	1.1%	3.9%
Land in farms (acres)	734,084	4,567	16,713	84,513	220,611
Average size of farm (acres)	74	1,142	929	813	576
Harvested cropland	411,785	4,199	12,872	59,132	164,680
Market value of agricultural products sold ($1000s)	$1,097,950	$117,202	$279,166	$549,975	$824,195
Average per farm ($)	$111,095	$29,300,442	$15,509,211	$5,288,225	$2,151,945

Source: 2017 Census of Agriculture, USDA, National Agricultural Statistics Service

The Economic Contribution of New Jersey Agriculture

An economic analysis was conducted using IMPLAN input-output software to estimate the total economic contribution of New Jersey's agricultural industry. IMPLAN provides a detailed account of the New Jersey economy, revealing how each sector in the economy is linked to one another by tracking the flow of goods and services throughout the economy. This analysis estimates the total contribution (direct, indirect, and induced effects) of New Jersey's agriculture industry on output (sales), labor income, and employment. Table 3 presents the results of the analysis aggregated by major commodity group. All dollar figures are presented in 2017 dollars.

Economic impact analysis revealed that the total economic impact of New Jersey agriculture was $2.1 billion in output (sales) and 31,231 jobs. Nursery and greenhouse production represented the largest commodity impact, generating $950 million in economic impact and supporting 10,266 jobs. The fruit and vegetable sectors combined, produced $726.1 million in economic impact and supported 18,572 jobs.

Table 3. Economic Contribution of Agriculture by Commodity

Commodity	Farms w/ Sales	Land in Farms (acres)	Hired Farm Workers	Direct Sales ($)	Economic Impact (jobs)	Economic Impact ($ Sales)
Grains and Oilseeds	1,349	197,839	550	$92,222,000	1,067	$166,394,000
Vegetables	1,390	88,106	5,166	$222,465,000	7,498	$449,463,000
Fruits and Berries	949	66,500	8,178	$141,323,000	11,074	$276,604,000
Nursery, Greenhouse, Floriculture, and Sod	1,238	83,254	7,486	$498,125,000	10,266	$949,558,000
Other Crops (inc. hay, Christmas trees)	3,734	160,715	1,348	$30,395,000	1,465	$61,636,000
Animal Production	3,954	137,670	2,528	$113,421,000	3,407	$187,840,000
New Jersey Agriculture	**9,883**	**734,084**	**25,256**	**$1,097,950,000**	**31,231**	**$2,056,431,000**

Farms w/ sales, land in farms, hired workers, and direct sales from 2017 Agricultural Census, USDA, National Agricultural Statistics Service. Economic impact estimates on jobs and sales derived using IMPLAN 2018 Data. Farms do not add to total to avoid double counting farms producing multiple commodities. Economic impacts do not add to total to avoid double counting inter-industry purchases between commodity sectors. Other items may not add to total due to rounding.

State and Local Taxes

New Jersey agriculture generated approximately $96.1 million ($31.9 million directly and $64.2 million indirectly) in tax revenue for state and local tax jurisdictions in 2017. Taxes included are social insurance tax, property tax, motor vehicle tax, income tax, and other taxes and fees.[4]

Other Sectors Impacted

Industry sectors most impacted (based on output impact) by New Jersey's agriculture industry are listed in Table 4. Real estate, wholesalers of non-durable goods, agricultural support services, and animal food manufacturing are the top four impacted industry sectors in terms of output (sales).

Table 4. Economic Impact on Related Industries

Industry Sector	Output Impact ($ millions)	Employment Impact (jobs)
Real estate	$103.6	515
Wholesale - Other nondurable goods merchant wholesalers	$79.5	230
Support activities for agriculture and forestry	$47.9	1,269
Animal food manufacturing	$35.7	32
Pesticide and other agricultural chemical manufacturing	$27.6	17
Truck transportation	$22.3	125
Insurance carriers, except direct life	$21.6	31
Petroleum refineries	$12.7	2
Air transportation	$12.3	26
Maintenance and repair construction of nonresidential structures	$9.3	42

Economic Impact by County

At the county level, Cumberland County accounted for the largest economic impact, generating $403.7 million in economic impact. Atlantic County generated the second largest economic impact of $233.3 million.

[4] IMPLAN's estimated tax impacts are based on actual taxes collected by governments in the given data year (i.e., estimated tax impacts are not based on tax rates). IMPLAN allocates taxes by labor income in each sector, and distributes by type of tax based on the Annual Census of Government Finances distribution.

Table 4. Economic Contribution of Agriculture by County

County	Farms w/ Sales	Land in Farms (acres)	Hired Farm Workers	Direct Sales ($)	Economic Impact ($ sales)
Atlantic	450	29,016	6,769	$120,673,000	$233,368,000
Bergen	74	1,051	235	$4,964,000	$9,419,000
Burlington	915	96,256	2,371	$98,581,000	$184,959,000
Camden	197	9,298	649	$22,693,000	$43,910,000
Cape May	164	8,135	229	$9,837,000	$18,389,000
Cumberland	560	66,256	4,068	$212,649,000	$403,740,000
Essex	22	191	(D)	$71,000	$116,000
Gloucester	580	49,381	1,668	$102,454,000	$195,153,000
Hudson	4	26	0	(D)	(D)
Hunterdon	1,604	101,290	1,443	$92,245,000	$171,086,000
Mercer	323	25,230	547	$24,982,000	$46,030,000
Middlesex	217	16,023	544	$38,358,000	$72,483,000
Monmouth	838	39,198	1,451	$80,633,000	$148,946,000
Morris	418	14,514	1,131	$24,825,000	$47,035,000
Ocean	260	8,510	442	$24,640,000	$45,514,000
Passaic	89	1,893	90	$2,801,000	$5,286,000
Salem	781	98,239	1,223	$102,342,000	$192,468,000
Somerset	452	35,862	631	$20,118,000	$36,851,000
Sussex	1,008	59,766	559	$18,226,000	$32,974,000
Union	9	75	(D)	(D)	(D)
Warren	918	73,874	1,085	$93,218,000	$168,705,000
New Jersey Agriculture	**9,883**	**734,084**	**25,256**	**$1,097,950,000**	**$2,056,431,000**

Farms w/ sales, land in farms, hired workers, direct sales: from 2017 Agricultural Census, USDA, National Agricultural Statistics Service. Economic impact estimate ($ sales) derived using IMPLAN 2018 Data. (D) - Withheld to avoid disclosing data for individual farms. Hired farm workers and direct sales don't add to total due to disclosure (D). Other items may not add to total due to rounding.

Summary

In 2017, New Jersey agriculture generated $1.1 billion million in direct annual sales on 734,084 acres of farmland. The economic impact to New Jersey through backward linkages totaled $2.1 billion annually. Yet the importance of New Jersey agriculture surpasses economic and food production benefits. A healthy agricultural sector adds an important component of regional security in preparation for extreme emergencies such as natural disasters, terrorist attacks and pandemics. In addition, agriculture provides other public benefits such as clean air, clean water, water recharge, wildlife habitat, open space, and a rural lifestyle. In New Jersey, the most densely populated state, these public benefits are especially important.

Appendix I – Economic Contribution by Commodity and County

Economic Contribution by County - Grains and Oilseeds

County	Farms w/Sales	Direct Sales ($)	Economic Impact ($ sales)	Percent of Total
Atlantic	40	$646,000	$1,166,000	0.7%
Bergen	6	$15,000	$27,000	0.0%
Burlington	162	$9,986,000	$18,017,000	10.8%
Camden	20	$273,000	$493,000	0.3%
Cape May	24	$208,000	$375,000	0.2%
Cumberland	148	$9,417,000	$16,991,000	10.2%
Essex	0	$0	$0	0.0%
Gloucester	122	$7,638,000	$13,781,000	8.3%
Hudson	0	$0	$0	0.0%
Hunterdon	138	$10,275,000	$18,539,000	11.1%
Mercer	48	$3,171,000	$5,721,000	3.4%
Middlesex	36	$2,872,000	$5,182,000	3.1%
Monmouth	59	$3,813,000	$6,880,000	4.1%
Morris	21	$459,000	$828,000	0.5%
Ocean	24	$276,000	$498,000	0.3%
Passaic	0	$0	$0	0.0%
Salem	253	$25,564,000	$46,124,000	27.7%
Somerset	41	$1,794,000	$3,237,000	1.9%
Sussex	61	$1,893,000	$3,415,000	2.1%
Union	0	$0	$0	0.0%
Warren	146	$13,922,000	$25,119,000	15.1%

Economic Contribution by County - Vegetables

County	Farms w/Sales	Direct Sales ($)	Economic Impact ($ sales)	Percent of Total
Atlantic	96	$29,447,000	$59,494,000	13.3%
Bergen	16	$267,000	$539,000	0.1%
Burlington	120	$9,452,000	$19,097,000	4.3%
Camden	35	$8,472,000	$17,117,000	3.8%
Cape May	31	$938,000	$1,895,000	0.4%
Cumberland	89	$47,703,000	$96,378,000	21.5%
Essex	1	(D)	(D)	(D)
Gloucester	104	$41,557,000	$83,961,000	18.7%
Hudson	0	$0	$0	0.0%
Hunterdon	132	$5,695,000	$11,506,000	2.6%
Mercer	55	$4,188,000	$8,461,000	1.9%
Middlesex	64	$6,755,000	$13,648,000	3.0%
Monmouth	126	$5,475,000	$11,062,000	2.5%
Morris	88	$4,809,000	$9,716,000	2.2%
Ocean	23	$2,684,000	$5,423,000	1.2%
Passaic	20	$471,000	$952,000	0.2%
Salem	114	$43,641,000	$88,171,000	19.6%
Somerset	72	$2,403,000	$4,855,000	1.1%
Sussex	104	$1,877,000	$3,792,000	0.8%
Union	2	(D)	(D)	(D)
Warren	98	$6,388,000	$12,906,000	2.9%

Economic Contribution by County - Fruits & Berries

County	Farms w/Sales	Direct Sales ($)	Economic Impact ($ sales)	Percent of Total
Atlantic	98	$69,655,000	$136,332,000	49.3%
Bergen	5	$1,104,000	$2,161,000	0.8%
Burlington	115	$22,885,000	$44,792,000	16.2%
Camden	34	$6,510,000	$12,742,000	4.6%
Cape May	27	$735,000	$1,439,000	0.5%
Cumberland	45	$11,628,000	$22,759,000	8.2%
Essex	1	(D)	(D)	(D)
Gloucester	53	$6,794,000	$13,298,000	4.8%
Hudson	0	$0	$0	0.0%
Hunterdon	119	$4,604,000	$9,011,000	3.3%
Mercer	37	$1,238,000	$2,423,000	0.9%
Middlesex	15	$505,000	$988,000	0.4%
Monmouth	74	$3,363,000	$6,582,000	2.4%
Morris	51	$2,928,000	$5,731,000	2.1%
Ocean	11	$307,000	$601,000	0.2%
Passaic	18	(D)	(D)	(D)
Salem	37	$4,641,000	$9,084,000	3.3%
Somerset	44	$211,000	$413,000	0.1%
Sussex	88	$1,545,000	$3,024,000	1.1%
Union	2	(D)	(D)	(D)
Warren	75	$2,601,000	$5,091,000	1.8%

Economic Contribution by County - Nursery & Greenhouse

County	Farms w/Sales	Direct Sales ($)	Economic Impact ($ sales)	Percent of Total
Atlantic	60	$18,768,000	$35,777,000	3.8%
Bergen	28	$3,578,000	$6,821,000	0.7%
Burlington	119	$47,039,000	$89,669,000	9.5%
Camden	13	$7,354,000	$14,019,000	1.5%
Cape May	28	$6,628,000	$12,635,000	1.3%
Cumberland	131	$137,690,000	$262,474,000	27.8%
Essex	8	(D)	(D)	(D)
Gloucester	71	$37,974,000	$72,388,000	7.7%
Hudson	0	$0	$0	0.0%
Hunterdon	136	$49,309,000	$93,996,000	10.0%
Mercer	81	$10,905,000	$20,788,000	2.2%
Middlesex	47	$27,124,000	$51,706,000	5.5%
Monmouth	165	$53,267,000	$101,541,000	10.8%
Morris	78	$13,843,000	$26,388,000	2.8%
Ocean	31	$16,395,000	$31,253,000	3.3%
Passaic	21	$2,187,000	$4,169,000	0.4%
Salem	48	$13,223,000	$25,207,000	2.7%
Somerset	61	$7,196,000	$13,717,000	1.5%
Sussex	44	$1,960,000	$3,736,000	0.4%
Union	3	(D)	(D)	(D)
Warren	65	$40,793,000	$77,762,000	8.2%

Economic Contribution by County - Other Crops

County	Farms w/Sales	Direct Sales ($)	Economic Impact ($ sales)	Percent of Total
Atlantic	105	$587,000	$1,190,000	1.9%
Bergen	7	(D)	(D)	(D)
Burlington	229	$1,737,000	$3,522,000	5.8%
Camden	54	(D)	(D)	(D)
Cape May	46	$261,000	$529,000	0.9%
Cumberland	191	$1,001,000	$2,030,000	3.3%
Essex	0	$0	$0	0.0%
Gloucester	192	$890,000	$1,805,000	3.0%
Hudson	2	(D)	(D)	(D)
Hunterdon	791	$8,983,000	$18,216,000	29.8%
Mercer	108	$513,000	$1,040,000	1.7%
Middlesex	61	$336,000	$681,000	1.1%
Monmouth	228	$1,471,000	$2,983,000	4.9%
Morris	173	$1,079,000	$2,188,000	3.6%
Ocean	70	$314,000	$637,000	1.0%
Passaic	16	(D)	(D)	(D)
Salem	336	$3,282,000	$6,655,000	10.9%
Somerset	202	$2,778,000	$5,633,000	9.2%
Sussex	529	$3,556,000	$7,211,000	11.8%
Union	0	$0	$0	0.0%
Warren	394	$3,376,000	$6,846,000	11.2%

Economic Contribution by County - Animal Production

County	Farms w/Sales	Direct Sales ($)	Economic Impact ($ sales)	Percent of Total
Atlantic	117	$1,570,000	$2,600,000	1.4%
Bergen	31	(D)	(D)	(D)
Burlington	335	$7,482,000	$12,391,000	6.6%
Camden	53	$84,000	$139,000	0.1%
Cape May	70	$1,067,000	$1,767,000	0.9%
Cumberland	136	$5,210,000	$8,628,000	4.6%
Essex	15	$71,000	$118,000	0.1%
Gloucester	184	$7,601,000	$12,588,000	6.7%
Hudson	2	(D)	(D)	(D)
Hunterdon	735	$13,379,000	$22,157,000	11.8%
Mercer	108	$4,967,000	$8,226,000	4.4%
Middlesex	83	$766,000	$1,269,000	0.7%
Monmouth	381	$13,244,000	$21,934,000	11.7%
Morris	173	$1,707,000	$2,827,000	1.5%
Ocean	120	$4,664,000	$7,724,000	4.1%
Passaic	44	$143,000	$237,000	0.1%
Salem	286	$11,991,000	$19,859,000	10.6%
Somerset	180	$5,736,000	$9,500,000	5.1%
Sussex	468	$7,395,000	$12,247,000	6.5%
Union	3	(D)	(D)	(D)
Warren	430	$26,138,000	$43,288,000	23.1%

Appendix II – IMPLAN Model

IMPLAN is a regional economic analysis software application that is designed to estimate the impact or ripple effect (specifically backward linkages) of a given economic activity within a specific geographic area through the implementation of its Input-Output model. IMPLAN provides the estimated indirect and induced effects of a given economic activity as defined by the user. In this publication, for ease of presentation, the direct effects (direct sales) and the total effects (economic impact) are shown; the difference between them is the aggregated indirect and induced effects. Several modifications were made to the IMPLAN data to reflect conditions in New Jersey. First, the IMPLAN model was used to aggregate the twelve agricultural sectors listed in Table 1 to six major agricultural sectors: Grains and Oilseeds; Vegetables; Fruits and Berries; Nursery, Greenhouse, Floriculture, and Sod; Other Crops; and Animal Production. Next, using data from the 2017 Agricultural Census, the model was modified to reflect 2017 agricultural output (sales), on-farm employment (25,256 workers)[5], and employee compensation of hired workers ($312.6 million). Finally, the model's production functions were redefined to ensure no double counting took place within agricultural sectors.

The following assumptions are true of IMPLAN as with any Input-Output Model:

- Backward-linkages
- Constant returns to scale
- No supply constraints
- Fixed input structure
- Model is static
- Prices are static.

Input-Output models do not account for forward linkages. Price changes cannot be modeled in IMPLAN directly; instead, the final demand effects of a price change must be estimated by the analyst before modeling them in IMPLAN to estimate the additional economic impacts of such changes.

[5] Only hired employees are considered, including both family labor and seasonal and non-seasonal workers.