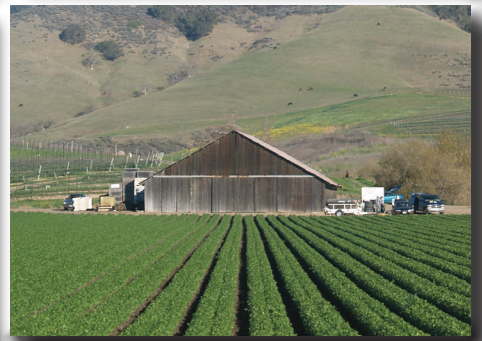


ECONOMIC CONTRIBUTIONS OF SAN LUIS OBISPO COUNTY AGRICULTURE



CROP REPORT PLUS
October 2019

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The Honorable Board of Supervisors

Supervisor John Peschong, District 1
Supervisor Bruce Gibson, District 2
Supervisor Adam Hill, District 3 (Vice Chair)
Supervisor Lynn Compton, District 4
Supervisor Debbie Arnold, District 5 (Chair)

In 2013, the San Luis Obispo County Department of Agriculture/Weights and Measures published a report in tandem with our traditional Crop Report. This new report went far beyond the traditional reporting on crop production values and acreage by examining and quantifying the overall economic contributions made by our local agricultural industry through food production, local food processing, employment and economic multipliers. By evaluating agriculture in this manner and using twenty-first century economic tools, we were able to paint a clearer picture regarding the role agriculture plays in sustaining our local economy.

We received positive feedback on the 2013 report as policy makers, the public and other interested parties found the information to be useful and beneficial. Due to this response, and the need to periodically update our findings, we have commissioned another study to identify any changes that have taken place over time. The department will continue to produce these reports every five to seven years to identify trends, to keep the public informed and to highlight agriculture as a significant economic component in our community.

I am pleased to share the *2019 Economic Contributions of San Luis Obispo County Agriculture* as an update to our 2013 study. Based on 2017 data, this update indicates that agriculture contributed \$2.54 billion to the local economy. This represents a 35.7% increase over our 2013 findings and far exceeds the gross production value of \$924 million as outlined in our traditional 2017 Crop Report. Additionally, agriculture supported 10,651 direct employees, or about one out of every sixteen jobs in the county. When multiplier effects are added, this number increases to 13,393 jobs that can be attributed to the existence of agricultural operations in the County. Please see **Figure 4** on page 12 for a side-by-side comparison of the 2013 and 2019 findings. Agriculture also provided a stabilizing force to the local economy, with overall crop diversity up slightly from our 2013 results.

Agriculture has a long tradition in San Luis Obispo County. For more than a century, it has been a pillar of our economy and culture. With this report, we renew our commitment to sustaining that tradition well into the future.

Sincerely,
Martin Settevendemie
Agricultural Commissioner/Sealer of Weights & Measures

ECONOMIC CONTRIBUTIONS OF SAN LUIS OBISPO COUNTY AGRICULTURE

FOR 2017, SAN LUIS OBISPO COUNTY AGRICULTURE:

...contributed a total of 2.54 billion to the local economy, including:

- 1.79 billion in direct economic output, representing 7.0% of the county's total economic output.
- \$758.4 million in additional economic output in the form of expenditures by agriculture companies and their employees
- This equates to just over \$6.97 million per day.

...provided 13,393 jobs, including:

- 10,651 direct employees, or about one out of every sixteen jobs in the county.
- 2,743 additional jobs attributable to expenditures by agriculture companies and their employees.

...had a medium level of resilience to economic shocks, as measured by its Shannon-Weaver Index of 0.52. Resilience has increased slightly since last checked in 2011.

INTRODUCTION

Residents and visitors alike know and value the contributions agriculture makes to San Luis Obispo County. Strawberries, wine grapes, and dozens of other crops grow in deep, fertile soils and help feed the world. Cattle and calves dot the hillsides while more than a dozen farmers' markets bustle with local products and pride.

Clearly, agriculture plays a vital role in sustaining a healthy local economy. What's not so clear, however, is the true size of that role. How much money does agriculture pump into the local economy? How many jobs does agriculture support? In other words, just how important is agriculture as a driver of San Luis Obispo County's economic health?

This report sheds light on these and related questions. Using multiple data sources and advanced economic modeling techniques, it analyzes agriculture's total contribution to the San Luis Obispo County economy. The report also examines agricultural diversification and its role in supporting economic resilience. On the whole, the findings offer important information for policy makers, the public, and anyone who values a thriving local economy.

OUR APPROACH

When it comes to economic analysis, it's important to examine the fullest possible range of economic contributions. This report does that by focusing not just on direct economic effects such as farm production and employment, but also on multiplier effects. Multiplier effects are ripples through the economy. These ripples include inter-industry “business to business” supplier purchases as well as “consumption spending” by employees. The Multiplier Effects section on page 8 explains this further.

It's appropriate to calculate multiplier effects when analyzing what economists call a basic industry. A basic industry is one that sells most of its products beyond the local area and thus brings outside money into local communities. Agriculture easily qualifies as a basic industry in San Luis Obispo County. Therefore, this report includes multiplier effects when describing agriculture's total economic contribution.

Our analysis only examines agriculture's economic contributions. To understand agriculture's full economic impact, one would also need to assess agricultural-related costs to society, for example net impacts on water and other natural resources. While important, these impacts lie beyond the scope of this study.

Our calculations draw from local and national data sources. The local sources include industry experts and the Annual Report produced by the San Luis Obispo County Department of Agriculture/Weights and Measures. The main national data source is IMPLAN®, a widely used economic modeling program (see www.implan.com). IMPLAN® uses econometric modeling to convert data from more than a dozen federal government sources into local values for every U.S. county and zip code, across 536 industry sectors. Except where otherwise noted, all figures are from the year 2017, the most recent IMPLAN® dataset available. Please contact the authors for additional details on the methods used.



“DIRECT EFFECTS” OF SAN LUIS OBISPO COUNTY FARM PRODUCTION

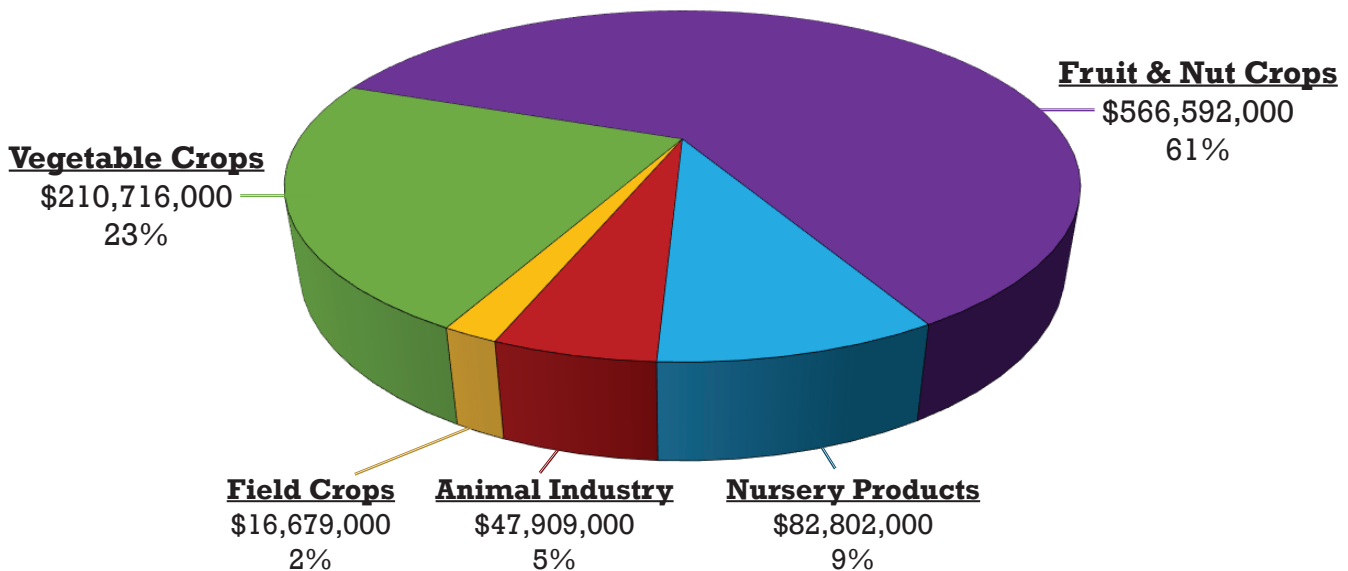
This section focuses on the simplest measures of economic activity: production and employment. It describes total farm production and the number of agricultural jobs.

Figure 1 shows the various categories that made up San Luis Obispo County farm production value. At \$566.6 million, Fruit & Nut Crops was the single largest production category by dollar value, comprising 61.3% of the county total. Two products dominated this category: Wine Grapes at \$267.6 million and Strawberries at \$228.2 million.

At 22.8%, Vegetable Crops represented the second largest category (\$210.7 million), led by Broccoli (\$43.0 million) and Cauliflower (\$23.3 million). Together, the two super categories of Fruit & Nut Crops and Vegetable Crops accounted for 84.1% of the county’s direct farm production values.

The combined, total dollar value for all products rose \$321.8 million over the previous decade, from \$602.9 million in 2008 to \$924.7 million in 2017. Inflation totaled 19.5% during this period, averaging just under 2% per year. Thus, agricultural production grew an impressive 33.9% even after adjusting for inflation. Total values do not reflect net profit or loss experienced by individual growers or by the industry as a whole. Interested readers are encouraged to consult the San Luis Obispo County Department of Agriculture/Weights and Measures’ 2017 Annual Report for additional details on specific products and their value.

Figure 1: Distribution of San Luis Obispo County Farm Production
Source: 2017 Annual Report, San Luis Obispo County Department of Agriculture/Weights and Measures





EMPLOYMENT

How many people work in agricultural production? For 2017, agricultural production directly employed 8,196 people in San Luis Obispo County. The figure encompasses a wide range of production-related jobs, including not just growing and harvesting, but also sales, marketing and many other roles. It does not include food processing jobs, which we discuss later. Nor does it include 22 jobs in the forest products sector or 141 jobs attributable to the county's \$3.0 million commercial fishing sector.

“MULTIPLIER EFFECTS” OF SAN LUIS OBISPO COUNTY FARM PRODUCTION

This section quantifies the economic “ripples” that farm production creates in the local economy. These ripples take two forms: indirect effects and induced effects. The first consist of “business to business” supplier purchases. For example, when a grower buys farm equipment, fertilizer, seed, insurance, banking services, and other inputs, the grower creates indirect effects.

The second ripple type, induced effects, consist of “consumption spending” by owners and employees of agriculture businesses and their suppliers. They buy groceries, housing, healthcare, leisure activities, and other goods and services for their households. All of this spending creates ripples in the economy.

Although agricultural companies and their employees certainly spend money outside in Santa Barbara County, Monterey County and many other locations outside San Luis Obispo County, this study only reflects those expenditures that occur within the county. Quantifying expenditures outside the county would be an expensive, complex effort that lies well beyond our scope here.

Figure 2 (page 9) shows agriculture's direct, indirect, and induced economic effects within the county, for major production categories. The numbers use IMPLAN® multipliers for each sector, which are rooted in U.S. Bureau of Economic Analysis data and other sources.

For example, “Fruit farming” in San Luis Obispo County has an indirect effects multiplier of 0.2830 and an induced effects multiplier of 0.2147. This means that for 2017, each dollar’s worth of direct output generated an additional 28 cents in supplier purchases, plus just over 21 cents in consumption spending by agricultural company owners and employees.

Every sector has its own, unique multipliers reflecting where companies and employees spent their money. Each sector also has its own unique multipliers for employment resulting in the combined employment figures shown in **Figure 2**.

Note that category names and production data in **Figure 2** differ from the county’s Annual Report. They follow a standard classification system used nationwide called the North American Industrial Classification System (NAICS). Each NAICS category has an explicit definition. For example, “Support activities for agricultural production” refers to soil preparation, planting, cultivating, harvesting, labor contracting, post-harvest crop activities and other farm management services.

Also, because IMPLAN® uses a different methodology than the county’s annual agriculture survey, the 2017 direct production value in **Figure 2**, \$900.0 million, differs slightly from the \$924.7 million reported in the 2017 Annual Report.

Agricultural production created \$1.324 billion in total economic output within San Luis Obispo County, of which \$424.5 million were multiplier effects. Agricultural production also supported 8,196 direct jobs, plus another 1,530 through multiplier effects, for a total of 9,726 jobs.

Figure 2: Economic Effect of San Luis Obispo County Farm Production

FARM PRODUCTION SECTOR	DIRECT	INDIRECT	INDUCED	TOTAL
	Output Effect (\$ Millions)			
Fruit farming	\$364.9	\$103.3	\$78.3	\$546.5
Support activities for agriculture	\$181.8	\$4.3	\$92.7	\$278.8
Vegetable & melon farming	\$187.4	\$45.4	\$32.4	\$265.2
Greenhouse, nursery & floriculture production	\$70.7	\$14.3	\$14.0	\$99.0
Livestock & animal products	\$54.6	\$12.1	\$6.5	\$73.3
Tree nut farming	\$27.8	\$7.9	\$6.4	\$42.2
All other crop farming	\$12.8	\$4.2	\$2.6	\$19.6
TOTAL ECONOMIC OUTPUT:	\$900.0	\$191.5	\$233.1	\$1,324.6
Employment Effect (# Jobs)				
TOTAL EMPLOYMENT:	8,196	750	780	9,726

Dollar values are in \$ millions. Figures are for 2017 and come from IMPLAN® and U.S. Bureau of Economic Analysis. Columns and rows might not add correctly due to rounding.

LOCALLY SOURCED, VALUE-ADDED FOOD PROCESSING

Farm production tells only part of the story. San Luis Obispo County is home to several food processors that play a key role in the local economy. This section captures the economic value of local food processing. It is neither an exact science nor a full assessment, but rather gives the reader a basic overview of the topic.

To avoid overstating the numbers, we only include food manufacturers and sectors that fit two strict criteria: 1) they use mostly local agricultural inputs; and 2) they are unlikely to exist here without the presence of the associated agricultural sector. Many processing facilities would not exist in San Luis Obispo County were it not for the abundant supply of fruit, vegetables, and other raw agricultural products.

Based on our strict criteria, we did not include the county's \$76.7 million bread and bakery products sector because most of its flour, yeast, and other raw ingredients come from outside the county. Likewise, the county's \$71.4 million spices and extracts sector sources its raw material from elsewhere. Even the county's nascent beer brewing sector (\$17.0 million) depends mostly on hops grown in the Pacific Northwest or Germany, as attempts to grow local hops have met with little commercial success.

Figure 3 (page 11) shows the economic effects of locally sourced, value-added food processing. At \$858.4 million in direct output, wineries dominate this category. San Luis Obispo is home to more than two hundred wineries, most of them in the Paso Robles AVA (American Viticultural Area). Nearly all of these wineries are small, family-run operations that include local grape production. The food production section above already captured the value of grape production (\$267.6 million). Thus, this section avoids double-counting by only reflecting the additional value created by turning grapes into wine.

Local industry groups have commissioned two economic studies on the county's wine industry. Both studies used IMPLAN® data supplemented with surveys of winery owners, and went far beyond the level of detail necessary here. Among other things, the studies extrapolated impacts beyond the county and estimated the value of wine tourism, including weddings. For details, readers may wish to visit www.pasowine.com.



The “Other food manufacturing” category in **Figure 3** combines several niche food products. For example, several boutique operations produce cheese from local milk and dozens of olive growers produce and sell a wide range of olive oils. A small portion of the county’s \$47.9 million in cattle, pigs, and other animal products is processed locally, using California’s only USDA-inspected mobile harvest unit. Many growers make jams, jellies, pastries, and other products from local strawberries and other fruit, selling them at farm stands, farmers’ markets, and in local stores.

Local food processing produced an estimated \$886.2 million in direct output. Multiplier effects bring the total value to \$1.220 billion. The sector directly employed 2,454 workers. These workers and their employers spent enough money in the local economy to support an additional 1,213 jobs, bringing San Luis Obispo County’s total food processing employment effect to 3,667.

Figure 3: Economic Effect of Locally Sourced, Value-Added Food Processing

FOOD PROCESSING SECTOR	DIRECT	INDIRECT	INDUCED	TOTAL
	Output Effect (\$ Millions)			
Wineries	\$858.4	\$206.3	\$118.6	\$1,183.3
Other food manufacturing	\$27.8	\$5.9	\$3.1	\$36.8
TOTAL ECONOMIC OUTPUT:	\$886.2	\$212.2	\$121.7	\$1,220.1
Employment Effect (# Jobs)				
TOTAL EMPLOYMENT:	2,454	748	465	3,667

Sources: IMPLAN® and U.S. Bureau of Economic Analysis data, with input by local industry experts. Columns and rows might not add exactly due to rounding.

TOTAL ECONOMIC CONTRIBUTION OF SAN LUIS OBISPO COUNTY AGRICULTURE

The previous sections have provided key pieces to an economic puzzle. This section combines those puzzle pieces into a final picture showing the overall economic effect of San Luis Obispo County agriculture.

As **Figure 4 (page 12)** shows, the total 2017 economic contribution of San Luis Obispo County agriculture was \$2.544 billion. This consisted of \$1.786 billion in combined, direct output from production and processing, plus \$758.4 million in multiplier effects. Additionally, our 2013 results are provided for a side-by-side comparison.

Figure 4: Overall Economic Effect of San Luis Obispo County Agriculture

TYPE OF EFFECT	DIRECT		INDIRECT		INDUCED		TOTAL	
FARM PRODUCTION SECTOR								
	2013	2019	2013	2019	2013	2019	2013	2019
OUTPUT EFFECT (\$ MILLIONS)	\$736	\$900	\$186	\$191.5	\$194	\$233.1	\$1,116	\$1,324
EMPLOYMENT EFFECT (# JOBS)	12,276	8,196	1,908	750	1,681	780	15,864	9,726
LOCALLY SOURCED, VALUE-ADDED PROCESSING SECTOR								
OUTPUT EFFECT (\$ MILLIONS)	\$559	\$886.2	\$141	\$212.2	\$57	\$121.7	\$758	\$1,220
EMPLOYMENT EFFECT (# JOBS)	3,343	2,454	941	748	497	465	4,781	3,667
TOTAL VALUE OF AGRICULTURAL INDUSTRY								
OUTPUT EFFECT (\$ MILLIONS)	\$1,296	\$1,786	\$328	\$403.6	\$251	\$354.8	\$1,874	\$2,544
EMPLOYMENT EFFECT (# JOBS)	15,619	10,651	2,849	1,498	2,178	1,245	20,645	13,393

Not all columns and rows add exactly due to rounding.

For perspective, agriculture pumped just under seven million dollars per day into the county economy during 2017 (\$6,971,607 to be exact), or \$290,484 per hour. The \$1.786 billion in direct output represented 7.0% of the county's total economic output of \$25.582 billion, about one out of every fourteen dollars.

Total employment was 13,393. This included 10,650 jobs directly in agriculture and another 2,743 attributable to multiplier effects. For perspective, the 10,650 direct agriculture jobs represented 6.3% of San Luis Obispo County's total employment of 169,320, or about one out of every sixteen jobs.

It should be noted that this recent study indicates a decrease in agricultural employment contributions as compared to the 2013 report. While many factors can influence job numbers, it is estimated that this decrease may correlate to the higher cost of living in San Luis Obispo County compared to other areas. While employees working in the agricultural industry may physically work in San Luis Obispo County, more of them may be living in lower cost areas of neighboring counties.

HOW RESILIENT IS AGRICULTURE TO ECONOMIC SHOCKS?

Like growers and ranchers everywhere, San Luis Obispo County agricultural producers face a long and growing list of risks. Prominent examples include: droughts, floods, disease outbreaks, new regulations, new competitors, labor availability and cost, price drops, and rising costs for fuel, equipment, and other inputs. Any one of these risks can deal a damaging blow. When combined, they can undermine not just an individual operation, but an entire industry.

What's the best way to lower these risks? Opinions vary, but most emphasize product diversification. From the old adage, "don't keep all your eggs in one basket" to the advice modern financial planners give, diversity tends to create stability. Diversification is especially important in today's uncertain times, as the pace and scale of change continue to grow.

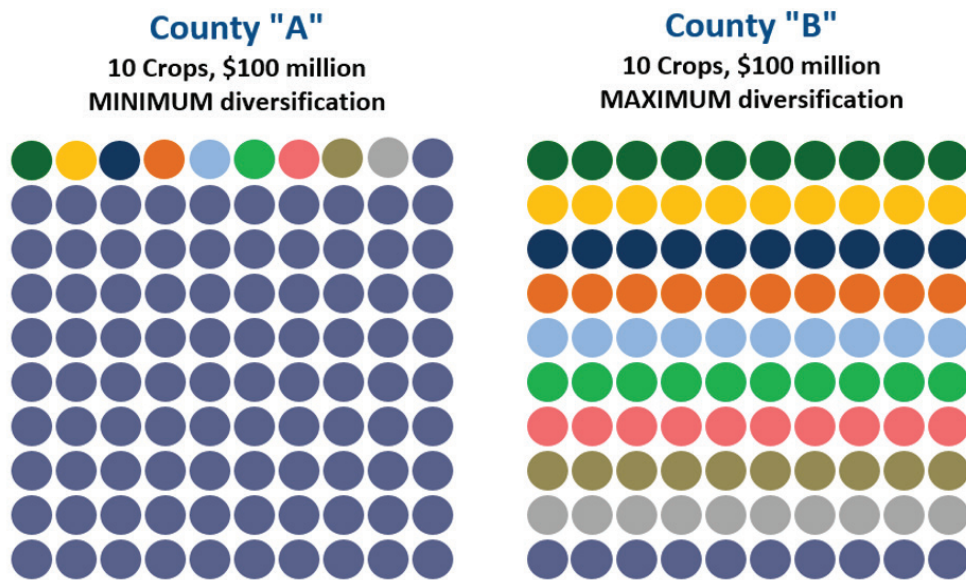
This raises the question: How economically diversified is San Luis Obispo County agriculture? Does the county have low agricultural diversity, thereby increasing its risk to catastrophic shocks? Or is agriculture highly diversified, promoting economic resilience?

To answer this question, we calculated the Shannon-Weaver Index for San Luis Obispo County agriculture. Created in 1949 for military codebreaking, the Shannon-Weaver index is now widely used by economists, ecologists, and others interested in quantifying diversity. Different versions of the basic Shannon-Weaver formula exist. What they all have in common, though, is that they quantify not just the number of different items – such as characters in a coded message, species in a rainforest, or crops grown in a county – but also their relative evenness or abundance.

Figure 5 portrays this relationship. County “A” and County “B” both grow the same number of crops and have the same total value of that production. But County “A” has a low index, near zero, because 91% of production concentrates in a single crop. Any shock to that crop could devastate the agricultural economy.

County “B” is the opposite. Production perfectly balances across all crop categories. Each crop type contributes 10% of the total. This gives County “B” the highest possible resilience against economic shocks.

Figure 5: Agricultural Diversification is More Than Just the Number of Products



The two fictitious counties have identical agricultural products and total revenues, but diversification gives County “B” greater resilience to economic shocks.

How exactly does one calculate the Shannon-Weaver Index for agriculture? The main steps are: 1) create a list of agricultural products and their production values; 2) remove minor, outlier products that have production values less than 0.25% of the county total, such as barley, squash, and English walnuts; 3) enter the data into the Shannon-Weaver formula; and 4) convert to a 1.0 scale. Readers who want more details may wish to consult an article on the topic available at www.ag-impact.com.

For 2017, the Shannon-Weaver Index for San Luis Obispo County's agricultural industry was 0.52. This gives agriculture medium protection from economic shocks. Of note, the index has risen a bit since we last reported. For 2011, it was 0.44 on the modern 1.0 scale, or 2.92 before conversion. If this upward trend continues, then it bodes well for economic resilience.

The main potential vulnerability lies with the county's growing dependence on strawberries and wine grapes. In 2000, strawberries accounted for just 3.2% of the county's total production value. By 2017, it had risen to 24.7%. Wine grapes accounted for 28.9% of the county's 2017 total production value. Wine grapes face particular risks from certain plant pests and diseases, including red blotch, the European Grapevine Moth, phylloxera, and Pierce's Disease. The Glassy-winged sharpshooter, an insect capable of transmitting Pierce's disease which is fatal to grapevines, is well established in southern California, has a wide host range, and can spread through the routine movement of nursery stock plants. The San Luis Obispo County Department of Agriculture/Weights and Measures operates an inspection and trapping program to help minimize this risk.

TOWARD THE FUTURE

This report has documented the role that San Luis Obispo County agriculture plays as a local economic driver. Including local food processing and multiplier effects, agriculture contributed \$2.544 billion to the county economy. Agriculture also played an important role in county employment, directly or indirectly supporting 13,393 jobs. Finally, agriculture's solid diversification continues to provide critical economic stability to the county. The economic value of this stability is certainly high, albeit hard to quantify.

Agriculture is an important pillar of the San Luis Obispo County economy and represents a vital link to both the county's cultural past and competitive future. Although this report has presented many facts and figures, it has barely begun to fill key information gaps about agriculture's role. The process of developing this report has raised several additional questions that lie beyond the scope of this report but may warrant future research (**Box 1, page 15**). In the meantime, the findings herein provide the clearest picture yet of San Luis Obispo County agriculture's important economic role.



BOX 1: ADDITIONAL QUESTIONS TO ANSWER

•**Processing.** The overwhelming majority of San Luis Obispo County's raw agricultural products leave the county for processing. What new policies, programs, and other initiatives could expand locally sourced, value-added food processing within San Luis Obispo County?

•**Water.** San Luis Obispo County's abundant food production depends on a water supply that faces mounting challenges. What measures, if implemented, could best safeguard this vital resource well into the future?

•**Keep More Jobs and Money Inside the County?** Economic multipliers for San Luis Obispo County agriculture are lower now than in the past, and below those of neighboring counties. Agricultural companies and their employees work in San Luis Obispo County but spend much of their money in Monterey County, Santa Barbara County, and elsewhere. What would it take to keep more of that money circulating within the county?

•**Ecosystem services.** What is the annual dollar value of wildlife habitat, scenic beauty, carbon sequestration, pollination, and more than twenty other "ecosystem services" that San Luis Obispo County's agricultural lands provide to society?

•**Economic Diversification.** How is the county trending not just in terms of product diversification, but also in other diversification measures such as farm size, farm ownership, and geographical markets?

•**Economic shocks.** How would potential "shocks" affect agriculture's economic results, for example significant new regulations, labor policies, water issues, or changes in the price of key inputs? Modern economic tools make it possible to quantify expected impacts.

•**Cannabis and Industrial Hemp.** Experts predict a major spike in cannabis and hemp cultivation in response to California's recent legislative changes for cannabis and the new federal designation of hemp as an agricultural crop. What economic opportunities and risks does this present for San Luis Obispo County growers?

ACKNOWLEDGMENTS

This report was produced by Agricultural Impact Associates LLC under contract to the San Luis Obispo County Department of Agriculture/Weights and Measures. Lead researchers were Dr. Jeff Langholz (jeff@ag-impact.com) and Dr. Fernando DePaolis (fernando@ag-impact.com). Martin Settevendemie supervised the project on behalf of the County. We would like to thank Marc Lea, Lynda Auchinachie and other agency staff who provided key input, as well as growers and other local industry experts who graciously contributed information about their operations.

For more information, please visit us at:

<https://www.slocounty.ca.gov/Departments/Agriculture-Weights-and-Measures>

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