

Economic Contributions of Placer County Agriculture





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Commissioner's Letter

I am pleased to share the **Economic Contributions of Placer County Agriculture**. This report takes an important step beyond the Placer County Crop Report that we publish every year. Instead of stopping at crop production values and acreage, it quantifies agriculture's total economic contributions through production, local processing, employment, and economic multiplier effects.

In short, this report uses twenty-first century economic tools to document agriculture's broader role in sustaining a thriving local economy.

This new study shows that in 2021, agriculture contributed a total of \$242.4 million to the county economy. This far exceeds the \$100.8 million figure from our 2021 Placer County Crop Report. It also marked a 24.5% increase from the \$182.9 million total in a similar report we published in 2020, based on data from 2018. Agricultural production and processing also directly supported 2,009 employees, plus another 89 from multiplier effects.

In addition, this report documents above-average economic diversification within agriculture, which has implications for countywide economic resiliency.

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

Respectfully submitted,

Joshua P. Huntsinger

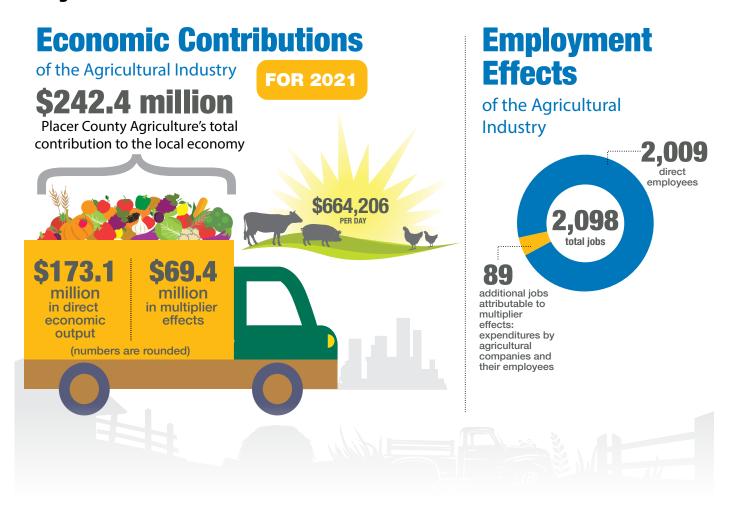
Director of Agriculture, Parks, and Natural Resources



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Placer County Agriculture By the Numbers





Introduction

In mid-2020, we published a research report that examined crop production values and wider economic contributions such as local food processing, employment, and multiplier effects. That document generated a strong positive response, providing detailed assessments of agriculture's role in sustaining a healthy local economy.

This document updates and expands upon that original report. Like before, we used multiple data sources and advanced economic modeling techniques to analyze agriculture's total contribution to the Placer County economy. As with the 2020 report, which was based on 2018 data, this one also measures economic diversification within agriculture, a topic with significant implications for economic resilience. Overall, the findings offer important information for policymakers, the public, and anyone who values a vibrant and resilient local economy.

Our Approach

A basic industry 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 Placer County.

Calculating a reasonable range of economic contributions by a basic industry entails quantifying three economic areas: 1) *direct* economic effects; 2) *indirect* economic effects; and 3) *induced* economic effects. This report covers all three.

Direct economic effects include farm production, local processing, and their related employment. Indirect effects consist of inter-industry, business-to-business supplier purchases. Induced effects reflect consumption spending by employees. The **Multiplier Effects** section on page 5 explains this further.

To understand the furthest economic impacts of agriculture, one would also need to assess agricultural-related costs to society, such as 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 Placer County Crop Report produced by the Agricultural Commissioner and Sealer of Weights and Measures. The main national data source is IMPLAN, a widely used economic modeling program (see www.implan.com).

Originally created for the U.S. Department of Agriculture (USDA), IMPLAN uses econometric modeling to convert data from more than a dozen government sources into local values for every U.S. county and zip code, across 546 industry sectors. Because IMPLAN draws from multiple sources, including the recent USDA Census of Agriculture, its employment and economic output numbers often differ from those reported by individual state and federal agencies.

Except where otherwise noted, all figures are from 2021, the most recent IMPLAN dataset available. Where appropriate, we adjusted sector names for clarity and applied coefficients to IMPLAN values to reflect unique Placer County conditions. Please contact the authors for additional details on the methods used.







Direct Effects of Placer 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.

PRODUCTION

Figure 1 shows the various categories that made up Placer County's farm production value. At \$34.1 million, Field Crops was the single largest production category by dollar value, comprising 33.9% of the county total.

Rice dominated this category with \$27.9 million, followed by irrigated pasture (\$2.5 million), hay and miscellaneous other field crops (\$2.4 million), and other pasture (\$1.3 million).

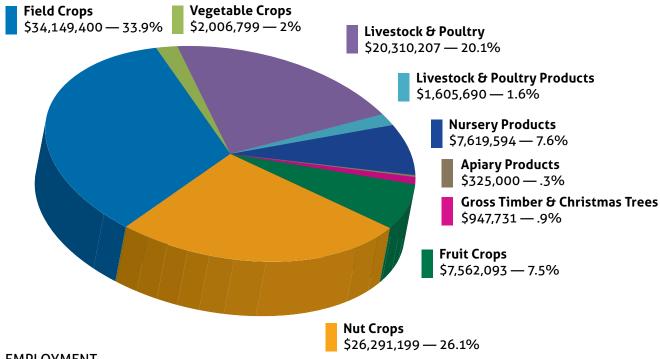
At 26.1%, Nut Crops represented the second largest category (\$26.3 million), consisting exclusively of walnuts and almonds. Livestock & Poultry was the next major category at \$20.3 million (20.1%).

The combined total dollar value for all products rose \$27.6 million over the previous decade, from \$72.2 million in 2012 to \$100.8 million in 2021. Inflation totaled 18.8% during this period, averaging 1.9% per year. Thus, agricultural production increased an impressive 18.9% after adjusting for inflation. A significant driver of recent growth has been thousands of acres of young walnut and almond trees that have come into production in the Sacramento Valley portion of the county.

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 county's 2021 Crop Report for additional details on specific products and their value.

Figure 1. Distribution of Placer County Farm Production

Source: 2021 Annual Crop Report, Placer County, Department of Agriculture Weights & Measures



EMPLOYMENT

How many people work in agricultural production? In 2021, IMPLAN data indicate that agricultural production directly employed 1,858 people in Placer County. This figure encompassed a wide range of production-related jobs, including not just growing and harvesting, but also sales, marketing, and many other roles. It did not include food processing jobs, which are discussed on page 6. Nor did it include Placer County's public sector jobs in agriculture, across a range of local, state, and federal agencies.

Multiplier Effects of Placer 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 consists of business-to-business supplier purchases. For example, when a grower buys fertilizer, pesticides, seed, insurance, banking services, farm equipment, and other inputs, the grower creates *indirect effects*.

The second ripple type, induced effects, consists of consumption spending by the combined owners and employees of agricultural businesses and their suppliers. They pay for groceries, housing, healthcare, leisure activities, and other things for their households. All this spending creates ripples in the economy.

Although agricultural companies, suppliers and their combined employees certainly spend money in other counties, this study only reflects those expenditures within Placer County. Quantifying expenditures outside the county would be an expensive, complex effort that lies well beyond our scope here.

Figure 2 shows agriculture's *direct*, *indirect*, and *induced* economic effects within the county, across major production categories. The numbers use IMPLAN multipliers for each sector, which are rooted in the most recent U.S. Bureau of Economic Analysis input-output models.



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 numbers shown in **Figure 2**.

For example, "Tree nut farming" in Placer County has an *indirect effects* multiplier of 0.1518 and an *induced effects* multiplier of 0.1364. This means that for 2021, each dollar's worth of direct output from walnuts and almonds generated an extra 15 cents in supplier purchases, plus about 13 more cents in consumption spending by agricultural company owners and employees.

Multipliers change every year for each sector and county in the entire nation to reflect where companies and employees spent their money. The *indirect effects* multiplier for Grain Farming in Placer County, for example, was 0.1649 in 2018 but rose to 0.4720 for 2021.

Note that category names and production values in **Figure 2** differ from the county's 2021 Crop Report. They follow a standard classification system used nationwide called the North American Industrial Classification System (NAICS), as modified by IMPLAN. Each NAICS/IMPLAN category has an explicit definition.

Also, because NAICS and IMPLAN use a different methodology than the county's annual agriculture survey, the \$108.4 million direct production value in Figure 2 differs slightly from the \$100.8 million total in the 2021 Crop Report. Among other things, NAICS and IMPLAN include pollination in a sector called "Support Activities for Agriculture & Forestry."



The following list helps bridge familiar Placer County commodities with NAICS and IMPLAN sectors:

- Grain Farming: Rice, Wheat, Corn (for fodder), Oats;
- **Beef Cattle Ranching & Farming:** Cattle & Calves;
- All Other Crop Farming: Hay (alfalfa & other), Pasture (irrigated & other);
- Greenhouse, Nursery & Floriculture Production: Nursery Stock;
- Fruit Farming: Apples, Grapes, Mandarins, Peaches, Pears, Plums, Strawberries, Misc. Fruits;
- Support Activities for Agriculture & Forestry: Pollination, Soil Preparation, Planting, Cultivating, Harvesting;
- Forestry & Forest Products: Timber, Christmas Trees;
- Tree Nut Farming: Walnuts, Almonds;
- Other Animal Production & Products (non-cattle): Eggs, Milk, Sheep, Wool, Fish, Goats, Turkeys, Swine;
- Vegetable & Melon Farming: Lettuce, Melons, Peppers, Pumpkins, Squash, Tomatoes, Miscellaneous.

Figure 2. Economic Effects of Placer County Farm Production

Dollar values are in \$ millions. Figures are for 2021 and come from IMPLAN and U.S. Bureau of Economic Analysis, with adjustments for local conditions. Not all columns and rows add exactly due to rounding.

	Outpu			
FARM PRODUCTION SECTOR	Direct	Indirect	Induced	TOTAL
Grain Farming	\$28.0	\$13.2	\$4.4	\$45.6
Tree Nut Farming	\$26.4	\$4.0	\$3.6	\$34.0
Beef Cattle Ranching & Farming	\$11.8 \$2.9		\$0.9	\$15.7
Support Activities for Agriculture & Forestry	\$7.8	\$0.0	\$4.3	\$12.2
Other Animal Production & Products (non-cattle)	\$10.0	\$10.0 \$0.5		\$11.7
Greenhouse, Nursery & Floriculture Production	\$7.6	\$1.3	\$0.8	\$9.8
Fruit Farming	\$7.6	\$1.1	\$0.9	\$9.5
All Other Crop Farming	\$6.2	\$1.7	\$1.0	\$9.0
Vegetable & Melon Farming	\$2.0	\$0.5	\$0.2	\$2.8
Forestry & Forest Products	\$0.9	\$0.1	\$0.4	\$1.5
TOTAL ECONOMIC OUTPUT	\$108.4	\$25.5	\$17.8	\$151.7
	Employment Effects (# Jobs)			
	Direct	Indirect	Induced	TOTAL
TOTAL EMPLOYMENT	1,858	19	12	1,889

ProductionKEY POINTS

1,858 DIRECT JOBS

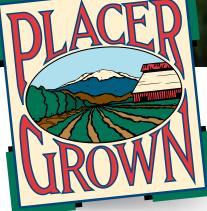
plus an additional 31 jobs from multiplier effects, for a total of 1,889 \$151.7 MILLION

in **total**economic output
from
Farm Production

\$108.4

in **direct** output from Farm Production \$43.3 MILLION

in **multiplier effects** from
Farm Production



Locally Sourced, Value-added Food Processing

Farm production tells only part of the story. This section captures the economic value of local food processing, which plays a key role in the Placer County economy. 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, i.e., Placer County's abundant supply of fruits, animals, and other raw agricultural products.

Figure 3 shows the economic effects of locally sourced, value-added food processing. As with **Figure 2**, the sector names draw from IMPLAN and NAICS, which lump and split products according to a national classification system for tracking economic output.

The largest category in Figure 3, "Canned Fruits & Vegetables Manufacturing" reflects local products that have been canned, jarred, or bottled. They include a wide array of jams, jellies, marmalades, sauces, syrups, marinades, and related products. Producers sell many of these products at the two mandarin festivals mentioned below, as well as at farmers markets, online, and retail stores. Although the ubiquitous mandarins find their way into these products, growers also use mulberries, apples, strawberries, persimmons, peaches, and other local fruit.

"Miscellaneous Other Food Manufacturing" combines multiple, niche activities. Many growers, for example, produce honey and then sell it retail or wholesale. Several growers produce olive oils, which, as with the local honey, they flavor with local fruit. Several operations add value to persimmons by using the traditional Japanese drying method known as "Hoshigaki" that preserves quality and enhances flavor. Two farms in Newcastle specialize in gourmet mushrooms, including selling mushroom grow kits online.



Mandarins offer a noteworthy example of a raw product with significant added value. Growers add value to mandarins through sorting, cleaning, bagging, boxing, and labeling, including for gift baskets. They sell retail and wholesale. At the time of writing, the county had over 60 mandarin growers (see www.getPlacerGROWN.com).

Each November, the annual Mountain Mandarin Festival takes place at the Gold Country Fairgrounds in Auburn and draws an estimated 30,000 visitors. In addition to fresh mandarins, guests also buy lightly processed foods, including fresh vegetables and fruit that have been peeled and cut before serving.

What Placer County's "Wineries" sector lacks in size, it makes up for in quality, tradition, and variety. More than twenty wineries transform the county's \$1.8 million grape crop into quality products. In contrast to many California counties, most Placer County wineries are boutique-scale operations that grow their own grapes. Many also host tastings, weddings, and other events, all of which add value. Others, such as a family-owned operation in Lincoln, not only produce wine, but also ferment honey

into mead and apples into cider. For details and lists of wineries, see the Placer Wine Trail organized by the Placer County Vintners Association (www.placerwine.com).

"Breweries" in Figure 3 reflects the ongoing boom in Placer County beer brewing operations, estimated at \$81.4 million in output for 2021. In most other California counties, beer brewing would not qualify for inclusion in a study like this because brewers depend on hops imported from the Pacific Northwest and Germany. In Placer County, however, some farm breweries grow their own hops and thus qualify as truly local beer. The amounts listed in Figure 3 reflect this, totaling 8% of the total Breweries figure.

A farm brewery in Newcastle, for example, grows an acre of hops on site. A farm near Lincoln also grows an acre of hops, and offers not only hand-crafted beers, but also mead, cider, and wine. A third farm grows thousands of hops plants across twenty varietals. With an estimated nineteen craft breweries, local beer is well enough established that a Placer County Wine and Ale Trail now exists, along with specialized support such as a brewery supply store in Auburn. As with wine, producers often infuse their beer with fruit grown on site.

Figure 3. Economic Effects of Locally Sourced, Value-added Food Processing

Sources: IMPLAN and U.S. Bureau of Economic Analysis data, with input by local industry experts. Not all columns and rows add exactly due to rounding.

	Output			
FOOD PROCESSING SECTOR	Direct	Indirect	Induced	TOTAL
Canned Fruits & Vegetables Manufacturing	\$20.0	\$5.7	\$2.0	\$27.8
Miscellaneous Other Food Manufacturing	\$18.8	\$6.0	\$2.3	\$27.1
Wineries	\$8.7	\$2.8	\$1.0	\$12.5
Animal Products Manufacturing	\$8.6	\$2.3	\$1.0	\$11.9
Breweries	\$6.5	\$1.6	\$0.7	\$8.8
Nut Processing & Products	\$2.1	\$0.4	\$0.2	\$2.7
TOTAL ECONOMIC OUTPUT	\$64.7	\$18.8	\$7.3	\$90.8
	Employr			
	Direct	Indirect	Induced	TOTAL
TOTAL EMPLOYMENT	151	40	18	209

"Animal Products Manufacturing" captures the portion of the county's cattle that stays local for processing. Most of the county's \$11.9 million in cattle & calves departs the county for processing in Nevada, at Harris Ranch, and at other locations. But a small amount goes to local butchers for slaughtering, processing, and packaging. In just one of many examples, a family farm in Penryn processes beef, lamb, and pork, then sells it directly to customers as frozen and vacuum packed cuts, as well as by the half or whole.

In addition to beef, this category also includes a wide range of other animal products. A farm in Loomis, for example, sells naturally-produced beef, poultry, pork, and eggs. An Auburn farm focuses on lamb products, integrated with an orchard and farm stand. A farm near Folsom Lake raises sheep, goats, rabbits, ducks, chickens, and quail, while an operation in Foresthill specializes in angora goats, producing raw fiber and spun yarn. A few places focus on alpacas, and sell battings, rovings, rugs, scarves, socks, and yarn. At least two farms add value to alfalfa by compressing it into pellets for animal feed.

"Nuts Processing & Products" in Figure 3 mostly reflects the portion of the county's \$14.5 million walnut crop and \$11.8 million in almonds that are processed within the county rather than shipped elsewhere. Most walnuts and almonds leave the county for hulling, drying, sorting, and packaging. A few farms, including two near Auburn and Penryn, process and package their nuts for direct sale, either raw or roasted, unflavored or flavored. A farm near Roseville specializes in pistachio products, including butters and pastes, but uses pistachios grown in Riverside County.

On a final note, totals in Figure 3 would increase if we added timber processing. Placer County provides key infrastructure to the greater region's wood products industry, producing lumber, packaging, and related products. Although calculating the exact contribution lies beyond the scope of this study, IMPLAN's "Sawmills" sector for Placer County reported \$17.3 million and 412 jobs for 2021. Contributors to this sector likely included a large mill in Lincoln and smaller mills and suppliers in Roseville, Sheridan, Foresthill, and elsewhere.



Total Economic Contributions of Placer 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 effects of Placer County agriculture.

As **Figure 4** shows, the total 2021 economic contribution of Placer County agriculture was \$242.4 million. This consisted of \$173.1 million in combined, direct output from production and processing, plus \$69.4 million in multiplier effects.

The \$242.4 million in total 2021 output marked a 24.5% increase from the \$182.9 million figure in our 2020 report, which was based on 2018 data. This growth approximates the 27.9% increase in production values during that time, as documented in the relevant Crop Reports.

For perspective, agriculture pumped \$664,206 per day into the county economy during 2021, compared to \$501,204 in 2018. This translates to \$27,675 per hour in 2021, compared to \$20,884 in 2018.

Type of Effect Direct Indirect Induced

Total agricultural employment covered in the scope of this study was 2,098. Of these, 2,009 jobs were directly in agriculture, with the remainder from multiplier effects.

Figure 4. Overall Economic Effects of Placer County Agriculture

Not all columns add exactly due to rounding.

	Type of Effect	חופנו	monect	IIIdaced	IOIAL	
	Output Effects (\$ Millions)	\$108.4	\$25.5	\$17.8	\$151.7	
	Employment Effects (# Jobs)	1,858	19	12	1,889	
	LOCALLY SOURCE	D, VALUE-ADI	DED FOOD PR	ROCESSING		
-	Output Effects (\$ Millions)	\$64.7	\$18.8	\$7.3	\$90.8	-
1	Employment Effects (# Jobs)	151	40	18	209	
	TOTAL VALU	JE OF AGRICU	LTURAL INDU	STRY		
TH	Output Effects (\$ Millions)	\$173.1	\$44.3	\$25.1	\$242.4	THE STATE OF THE S
-	Employment Effects (# Jobs)	2,009	59	30	2,098	TOTAL MANAGEMENT TOTAL
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How Resilient is Agriculture to Economic Shocks?

We have all heard the old saying "don't keep all your eggs in one basket." If the basket drops, then you might lose everything. This article takes a deep dive into that concept and focuses on three questions: 1) Why is economic diversification important? 2) How economically diversified is Placer County agriculture? and 3) How has agriculture's level of economic diversification trended over time?

Answers to these questions can shed important light on the agricultural industry's economic resilience, with implications for the wider county economy and beyond.

WHY IS ECONOMIC DIVERSIFICATION IMPORTANT?

Like growers and ranchers everywhere, Placer County's agricultural producers face a long list of risks. Examples include: wildfires, droughts, floods, pandemics, crop pests and diseases, food safety-related outbreaks, new regulations, new competitors, labor availability and cost, price drops, and rising costs for fuel, equipment, water 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.

Take Napa County, for example, where wine grapes account for 99% of the annual agricultural value. When wildfires and a pandemic caused a 51% decline in wine grapes for 2020, the county's overall agricultural value declined by that same percent. Contrast that with Placer County where, thanks to strong diversification, total agricultural output increased 4.6% during 2020 when the Covid-19 pandemic began, then added another 11.1% for 2021 during the pandemic's peak.

HOW DIVERSIFIED IS PLACER COUNTY AGRICULTURE?

If economic diversification is like an "insurance policy" against risks, then that raises the question: how economically diversified is Placer County agriculture?

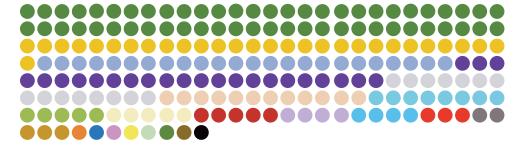
The Office of the Agricultural Commissioner first answered that question in its 2020 report titled, Economic Contributions of Placer County Agriculture. The study reported agriculture's Shannon-Weaver Index, a measure of diversification that captures not just the number of different commodities produced, but also their relative abundance. Agricultural officials in more than twenty other California counties have also reported their own index.

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 with production values less than 0.25% of the county total, such as apples, pears, plums, and wheat; 3) enter the data into the Shannon-Weaver formula; and 4) convert to a 1.0 scale. For additional details, please contact the authors.

Over the past decade, Placer County has consistently produced twenty-three major commodities. The relative contribution of individual commodities varied during this period. Figure 5 depicts their most recent relative contributions.

Figure 5. Relative Distribution of Placer County Agricultural Commodities

Colored circles represent approximately \$500,000 each and depict major agricultural commodities' relative contributions to Placer County agriculture's total 2021 farm gate value. Commodities less than \$500,000 in value are depicted with a single dot. The number of commodities produced, and their relative evenness, influences the industry's economic diversification score and its resilience to economic shocks.



For 2021, the Shannon-Weaver Index for Placer County's agricultural industry was 0.54.

Economic Contributions of Placer County Agriculture

What exactly does this number mean? For starters, getting the highest index, a perfect 1.00 on a scale from 0.00 to 1.00, would require the impossible: produce all seventy-two of California's major commodities and have farm gate values equally distributed across them. No single county could accomplish this.

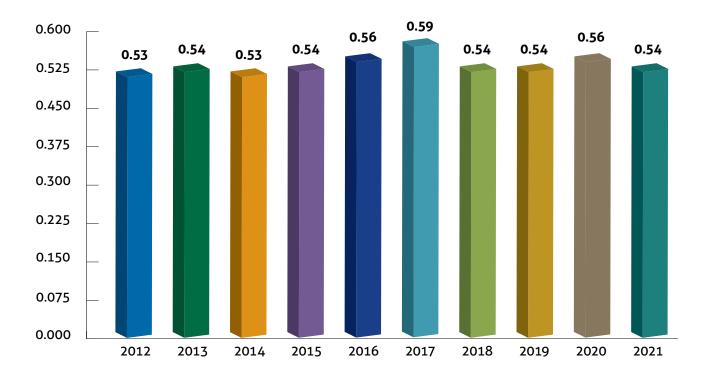
At first glance, Placer County's resulting index of 0.54 seems near the middle of 0.00 to 1.00 range. But the Shannon-Weaver formula includes a logarithmic function, which complicates interpretation. The logarithm makes the scale exponential, like the Richter Scale that measures earthquakes. Many Californians understand that a 7.4 earthquake releases twice the energy of a 7.2 earthquake even though the numbers are not far apart. The same principle applies here.

The 0.54 index is above average compared to other California counties analyzed thus far. This indicates Placer County agricultural production is both diverse and well-distributed across categories. The high level of diversification no doubt lessened the impact of recent wildfires and even the Covid-19 pandemic.

How Has Agriculture's Level Of Economic Diversification Trended Over Time?

Figure 6 shows the Shannon-Weaver Index for the past decade. The main thing to note is agriculture's consistent, high number across years. Even the lowest score, 0.53 in 2012 and 2014, is high compared to most other counties.

The steady, high index stands in contrast to the downward trend many California counties face—places that have become dependent on a few major products such as almonds, berries or wine grapes.



An indicator of economic resilience, the **Shannon-Weaver Index** quantifies diversification by combining the number of different commodities produced and their relative economic value. Compared to many other California counties, Placer County agriculture's index is high and holding steady over time.

Bottom Line

The discussion here supports three key points: 1) economic diversification helps buffer against economic shocks such as wildfires, droughts and even pandemics; 2) Placer County's agricultural industry enjoys an above-average level of economic diversification, which likely benefited the industry during the recent Covid-19 pandemic; and 3) agriculture's above-average level of economic diversification has held steady over time.

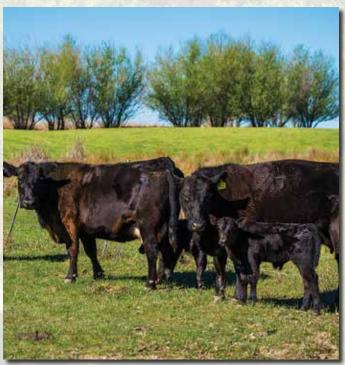
All of this bodes well for the future. In an era of rapid change and rising risks, the agricultural community can take pride and comfort in not having "all of its eggs in one basket."

Toward the Future

This report has documented the fuller contributions that Placer County agriculture makes to the local economy. Including local food processing and multiplier effects, agriculture contributed \$242.5 million to the county economy in 2021. Agriculture also played an important role in county employment, directly or indirectly supporting 2,098 jobs. Finally, agriculture's above-average diversification has provided critical economic stability and resilience not just to the agricultural industry, but to the larger county economy.

Agriculture is an important pillar of the Placer County economy and represents a vital link to the county's cultural past and competitive future. Agriculture will no doubt face many challenges and opportunities in the coming years. For now, the findings herein provide an important snapshot of Placer County agriculture's vital economic role.





Acknowledgments

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