



The Economic Contribution of Agriculture to the County of Santa Clara 2014



Santa Clara County Agriculture

- The agricultural industries included in this analysis produce a total of \$1.6 billion in output value and contribute a total of \$830 million annually to the Santa Clara County economy.
- These industries employ more than 8,100 workers annually.
- The resource base of agricultural land declined significantly in the 1980's and 1990's, but has recently stabilized. The value per acre and the value per worker created by Santa Clara County agriculture has continued to increase and has never been higher.
- Agriculture provides diverse stable employment opportunities for both skilled and unskilled laborers.
- Like the other high-tech industries in Santa Clara County, agriculture is growing in productivity per unit worker and per unit land.
- The Santa Clara County Open Space Authority estimated that the total value of Santa Clara County natural capital exceeds \$45 billion. Agriculture preserves some of these vital natural processes and adds to the character of the county.
- Agriculture can be viewed as self-financing open space, providing important ecosystem service values to county residents.

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Project Overview

It is a fundamental but not well-known fact that agriculture provides additional value beyond \$276 million in gross production value to the Santa Clara County economy. Growers purchase materials and machinery from local suppliers and employees of these industries purchase goods and services from other businesses in the county. Agriculture generates additional economic activity beyond the value of crop production. While the direct value of agriculture is commonly cited, the total economic activity generated in related industries is rarely quantified or mentioned in public policy decisions.

The Santa Clara County Agricultural Commissioner initiated this study to quantify the economic worth created by key agricultural industries in Santa Clara County and to trace that value from the field to final processing and consumption. Many farming activities are vital to preserving open space, providing habitat for native species, or improving other ecosystem processes. These benefits are often referred to as “ecosystem services” and their economic importance is presented in this report. To put all of these values in context, the report begins with a narrative and summary of recent trends in Santa Clara County agriculture.



Analysis

The study was conducted by ERA Economics, an agricultural and resource economics consultancy based in Davis, California, and included three phases:

1. **Survey** county agricultural businesses to collect economic data including expenditures, revenues, and employment statistics for 2014.
2. **Quantify** the value of primary crop production using the survey data and an economic model of Santa Clara County crop production for 2014.
3. **Estimate** the total economic value of each major agricultural sector in the county for 2014.

The project team integrated this data into the IMPLAN model (MIG, Inc.; Version 3.0 2013 R3 database, www.implan.com) and created a custom IMPLAN model reflecting the expenditure patterns and agricultural industries in Santa Clara County in 2014. This three-stage analysis approach is unique from other economic contribution and value analysis because it captures the economic linkages from the farm to all related industries.

Measures of Economic Value

This analysis includes 8 agricultural sectors: crop production, mushroom farms, nurseries, livestock, wine and agritourism, support industries, primary processing, and food manufacturing.

The economic contributions of each sector are defined as follows:

Production value: The gross sales value of an industry. In crop production, for example, this measure is equal to the price of the crop multiplied by the total production and analogous to the measure of production value reported in the Annual Crop Reports. <http://sccagriculture.org>

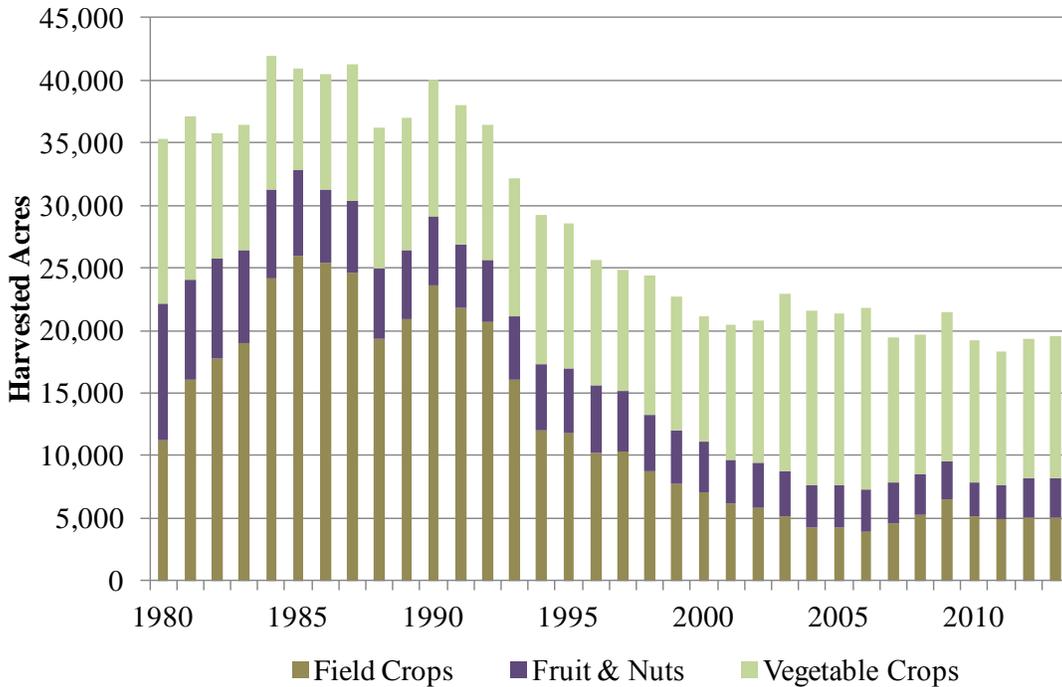
Value added: The net contribution of an industry to the Santa Clara County economy. It is equivalent to the commonly-cited national measure of economic activity known as Gross Domestic Product (or GDP).

Employment: The number of on-farm and off-farm jobs in a sector. This measure includes field laborers, farm management, and professional staff in related industries.

Trends in Agricultural Land Use

Like other industries in Santa Clara County, agriculture has been subject to constant change and development. There are two dominant forces driving this change. On one hand, there has been a significant reduction in the agricultural resource base of irrigated land due to urban development. Countering this effect are shifts in the crop mix toward higher-value commodities and increases in productivity that have created substantial growth in the value of agriculture per acre and per worker. The footprint of agricultural land is smaller, but the continued growth of both land and labor productivity has resulted in a county agricultural sector that is gaining in both production value and employment.

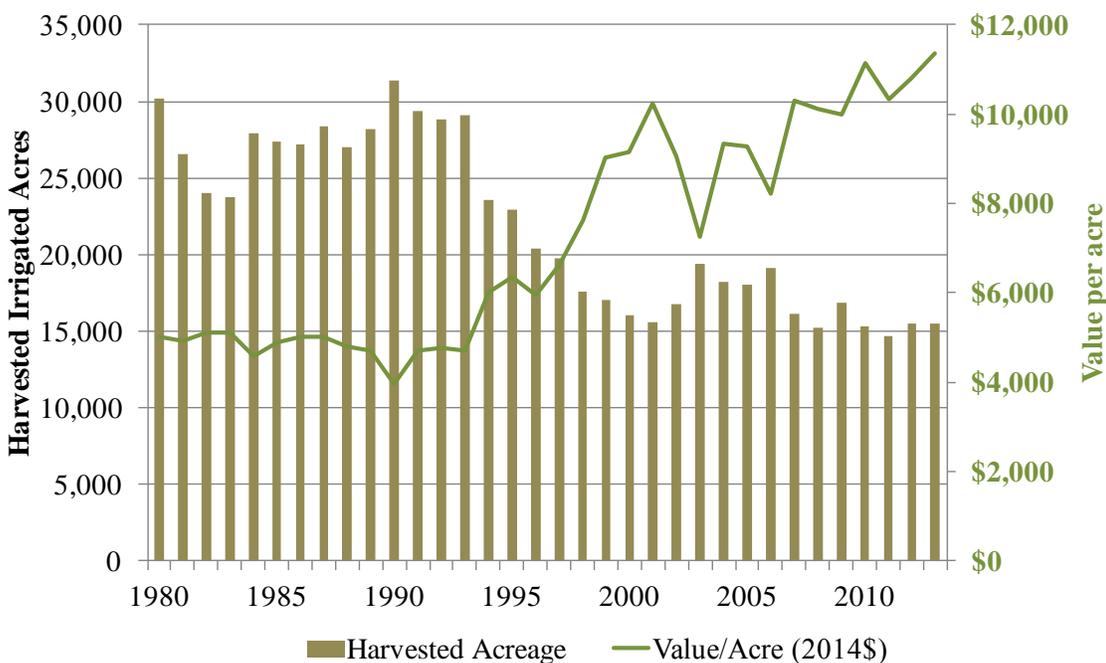
Figure 1. 1980 - 2013 Harvested Acreage by Crop Group



Over the last 30 years the land resource base has declined from a peak of 40,000 acres in the late 1980s to the current level of 20,000 acres. This excludes rangeland and currently includes approximately 4,000 acres per year of dry farmed grain hay.

The crop mix has shifted toward higher value, labor intensive, fruit and vegetable crops.

Figure 2. 1980 - 2013 Harvested Irrigated Acreage and Production Value per Acre

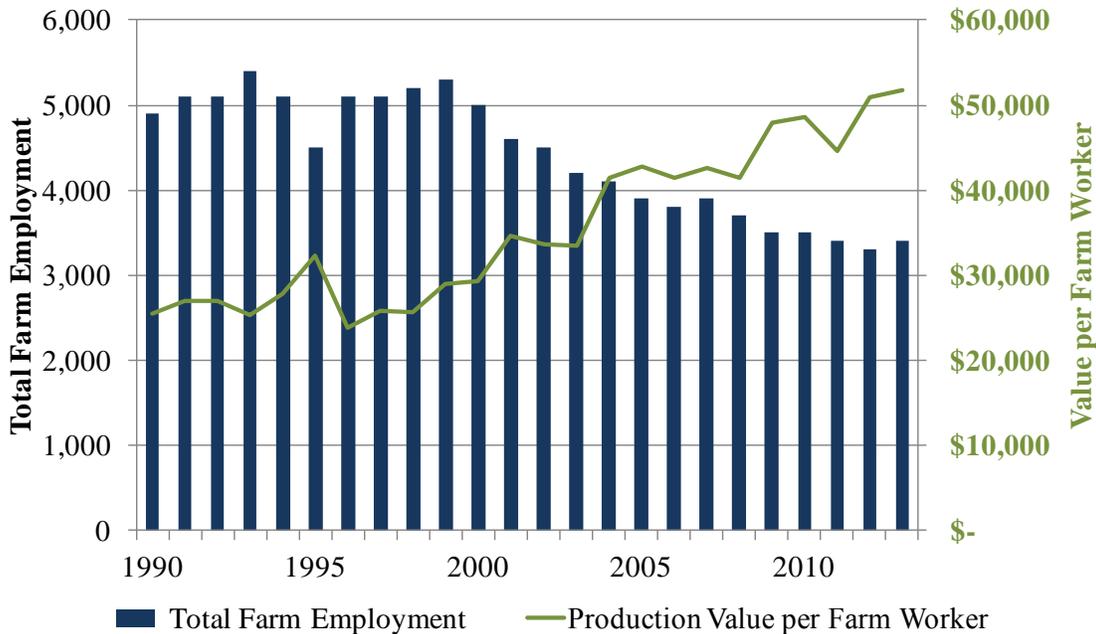


The increasing value per irrigated acre is driven by a shift toward higher value crops, increases in productivity, new technologies, and more efficient farming practices.

The value per irrigated acre has never been higher. The proximity to Silicon Valley tech firms provides opportunities for new innovation in precision agriculture technologies.

Labor Productivity and Current Trends

Figure 3. 1990 - 2013 Direct On-Farm Employment and Production Value per Worker



Labor productivity has mirrored the increases in productivity of irrigated land. Direct farm productivity per employee grew from \$27,000 in 1990 to the current level of \$55,000 per employee, essentially doubling in inflation-adjusted value.

The intensity of labor per acre has also increased. Between 1990 and 2000 irrigated land area in the county decreased by 50%, while farm employment only decreased by 26%.

Agriculture provides jobs for a sector of the economy not served by other industries in the county. Agriculture provides stable jobs for skilled and unskilled laborers. Many of these jobs are well-paying and provide year-round employment.

Santa Clara County agriculture is small but growing in value. Santa Clara County agricultural production ranks sixth in the state in land productivity at \$11,000 per acre. Despite its small size the county ranks 30th in the state in total agricultural production.

There are some policy challenges ahead, but the agricultural sector is well-suited to adapt. Irrigated agricultural production will be affected by several policies that are currently being implemented. The most significant policy change is the Sustainable Groundwater Management Act passed in 2014. While this will substantially change many of the Central Valley irrigated regions, Santa Clara County groundwater is already well managed and this will benefit producers in the county, assuming a continuation of the open space water pricing policy established by the Santa Clara Valley Water District.

Looking forward: Production. In the past, agricultural productivity was driven by expansion in several sectors, most notably, specialty vegetable crops, seed production and wholesaling, agritourism, and wine production. On-farm innovations and new technology will continue to drive future productivity growth in these sectors.

Looking forward: Demand. Consumer demand for healthy fruits, nuts, and vegetables is steadily increasing, driven by rising incomes at home and in international export markets. This trend supports strong prices for many of the crops produced in Santa Clara County.

Preserving open space. The Santa Clara County agricultural sector can be viewed as self-financing open space that generates jobs, value, and ancillary industries in the county. Sensible land preservation policies and water pricing in Santa Clara County will help ensure continued growth in the sector.

The Value of Agriculture

The value of an industry can be broken down into individual components. These components include the direct, indirect, and induced economic value. The indirect and induced effects can be thought of as the “ripple” effect in other related industries.

Direct: The economic effects of activity by an individual agricultural sector. For example, crop production.

Indirect: The economic effects of intermediate input purchases by the sector. For example, irrigation supply purchases for crop production.

Induced: The economic effects of spending by employees in all other industries. For example, farm workers purchase housing and food in the county.

Direct + Indirect + Induced = Total Value

This analysis considers a wide range of agricultural activities in Santa Clara County. Agriculture usually means primary crop production in the field. In Santa Clara County this might be garlic or fresh peppers. Some of these crops are processed in the county and some are shipped outside of the county for processing. Primary processing that occurs in the county is included in the analysis.

Santa Clara County is home to many award-winning wineries. Wine production is a high value industry which depends on the county vineyards, and is included in the analysis. In addition, wineries increase county agritourism. Agritourism also includes events such as the Gilroy Garlic Festival, Mushroom Mardi Gras, and local Farmers’ Markets. All of this economic activity is included in the analysis.

A little farther down the agricultural supply chain is the food manufacturing industry. In Santa Clara County, this includes cheese manufacturing and production of frozen meals. Arguably, this industry is one step removed from crop production on the field. However, the food manufacturing sector is included in the analysis as it does depend in part on the primary production and processing which originates in the county.

In total, Santa Clara County agriculture contributes \$832 million in value added to the Santa Clara County economy and employs 8,110 people annually.

	Direct	Indirect	Induced	Total
Production*	\$1,166	\$222	\$211	\$1,600
Value Added*	\$545	\$143	\$144	\$832
Employment	5,530	1,130	\$1,450	8,110

**All values in thousands of dollars*





Crop Production

The crop production sector includes field crops, vegetables (including seed production), and tree and nut crops. Mushrooms are reported separately. Santa Clara County’s crop mix—measured in terms of value of production or acreage—is largely comprised of vegetables in 2014. While fruits and field crops are also significant, nut crops are only a small component. The most valuable crops in the county are bell peppers, cherries, chili and wax peppers, fresh market tomatoes, and salad greens. Crop production is labor intensive and the fresh fruits and vegetables grown in the county are especially reliant on hand labor. It follows that crop production has the highest direct employment of the sectors in the report.

The crop production sector’s direct production value in 2014 equals \$126 million and is produced on 21,073 acres. An additional \$49 million is generated indirectly or induced, for a total production value of \$175 million. The sector generates 1,550 total jobs, including 1,150 direct jobs and 400 indirect and induced jobs.

Measure	Direct	Indirect	Induced	Total
Production	\$126 million	\$14 million	\$35 million	\$175 million
Value Added	\$101 million	\$10 million	\$23 million	\$135 million
Employment	1,150 jobs	150 jobs	250 jobs	1,550 jobs



- **Of the commodities included in the crop production sector, vegetables contribute a total of \$97 million to direct production value, fruits and nuts contribute \$25 million, pasture and rangeland contributes \$4 million, and grain hay contributes \$830,000, annually.**
- **Santa Clara County ranks 4th nationally in the value of pepper production.**
- **There are just over 1,000 farms in Santa Clara County with an average farm size of 225 acres.**
- **Strong domestic and international demand for the healthy fruits and vegetables produced in Santa Clara County continues to push prices for these commodities higher.**





Mushrooms

Santa Clara County is the second largest producer of mushrooms in California, with roughly a third of the state’s mushroom production being grown on fewer than ten commercial mushroom farms. California ranks as the second largest producer of mushrooms in the United States behind Pennsylvania, which accounts for over half of the nation’s mushroom production. The predominant mushrooms grown in Santa Clara County are white and brown varieties of *Agaricus bisporus*, commonly referred to as button, Crimini and Portabella mushrooms. Mushrooms are grown fifty-two weeks a year, providing full-time, year-round employment opportunities. Mushrooms are generally hand harvested and pickers are compensated based on pounds harvested. Inputs such as compost materials and spawn are largely purchased outside the county and the mushrooms produced in Santa Clara County are sold throughout North America. Mushroom production has an incredibly high value per acre—per square foot, even—as the mushrooms are grown in stacked trays in climate controlled rooms, and each tray is picked multiple times during the production cycle.

Measure	Direct	Indirect	Induced	Total
Production	\$71 million	\$11 million	\$18 million	\$100 million
Value Added	\$49 million	\$10 million	\$15 million	\$74 million
Employment	575 jobs	90 jobs	105 jobs	770 jobs



- **Santa Clara County grows one-third of California’s mushrooms on less than 10 farms.**
- **The value of mushrooms produced in Santa Clara County has increased by 20 percent over the last 10 years.**
- **California produces around 15 percent of total mushrooms produced in the United States, second only to Pennsylvania. In other words, Santa Clara County alone accounts for around 5 percent of all mushrooms produced in the United States.**
- **Mushrooms produced in the county can be found on pizzas, at local grocery stores, and as inputs to local food manufacturing and processing.**



Nurseries

The nursery sector includes bedding plants, Christmas trees, ornamental trees, roses and shrubs (including asters, carnations, delphiniums, eucalyptus, gardenias, lisianthus, snapdragons, stephanotis, and sunflowers), chrysanthemums, and other miscellaneous crops (including herbaceous perennials, indoor decoratives, orchids, propagative materials, turf, etc.). The nursery sector is incredibly diverse in terms of size of operation, number and type of commodities produced, and product distribution. One commonality among nurseries is that they typically generate high value products on a relatively small footprint, resulting in high revenue per acre. Nursery sales benefit from the nearby urban population and nursery operators often cite proximity to Bay Area cities as a positive factor. The indirect and induced impacts of the nursery sector—in both production value and employment—are relatively high compared to other sectors. This is in part because nursery products are somewhat more likely to be sold within the county or, as is the case with vegetable transplants, to be used as an input for another agricultural sector in the county.

Measure	Direct	Indirect	Induced	Total
Production	\$83 million	\$9 million	\$24 million	\$116 million
Value Added	\$57.5 million	\$6.5 million	\$16 million	\$80 million
Employment	670 jobs	80 jobs	170 jobs	920 jobs



- **The nursery sector is the highest-valued crop sector in Santa Clara County.**
- **Santa Clara County is second only to San Diego County in total number of cuttings, seedlings, and plugs operations.**
- **California accounts for nearly 25 percent of total U.S. nursery exports annually.**





Livestock

The livestock production sector includes beef cattle production, and miscellaneous animal production (e.g., chicken eggs, goats, llamas, pigs, and sheep). The predominant animal operations are family run cow-calf beef cattle. This sector is particularly self-sustaining, using minimal hired labor and relying on few outside inputs except leased private and public land for forage. The off-farm transactions that do take place are often outside of the county, such as when steers and heifers are sold at auction and bulls are purchased for breeding stock. As a result, the indirect and induced impacts for the livestock sector are generally lower than for other sectors.

The direct production value of the industry equals \$14 million on 222,652 acres of rangeland. The sector generates a total of 90 jobs. In addition to contributing to the local economy directly, the livestock sector provides important ecosystem services by preserving Santa Clara County grazing land. The benefit of these ecosystem services is not included in the economic values presented below.

Measure	Direct	Indirect	Induced	Total
Production	\$14 million	\$2 million	\$2 million	\$18 million
Value Added	\$6.5 million	\$1.5 million	\$1.4 million	\$9.5 million
Employment	55 jobs	20 jobs	15 jobs	90 jobs

- **The livestock sector contributes significant economic value by preserving open space. Open hills and rolling rangeland add to the majestic beauty of Santa Clara County. Careful economic analysis is required to determine the value that these intangible amenities provide to the community, but they can be as much as several hundred dollars per acre.**
- **Santa Clara County grazing land provides wildlife corridors, habitat for plants and animals, diverse ecosystem, carbon sequestration, soil benefits, space for recreation, and improves biodiversity.**





Wineries and Agritourism

The winery and agritourism sector includes wine production and sales (on-site and off-site), and commercial agricultural enterprises conducted for the enjoyment or education of visitors, such as weddings and events. These ancillary activities generate new visits as well as repeat customers, increase wine sales, diversify revenue streams, engage the public, and strengthen the brand experience. Agritourism activities such as weddings and events often reach a different part of the economy than other agricultural activities and the indirect and induced effects in this sector include vendors hired for events.

Santa Clara County boasts over sixty licensed wineries and is represented by five American Viticultural Areas - the Santa Cruz Mountains, Santa Clara Valley, Central Coast, San Francisco Bay, and Pacheco Pass appellations. Wine production in Santa Clara County began with grapes grown at the Mission Santa Clara. The region is referred to by noted wine historian Charles L. Sullivan as “the original premium wine growing region in the modern era of winemaking in America.”

Measure	Direct	Indirect	Induced	Total
Production	\$269.5 million	\$69 million	\$46 million	\$385 million
Value Added	\$108 million	\$42 million	\$30 million	\$180 million
Employment	655 jobs	270 jobs	320 jobs	1,245 jobs

Wineries are measured distinctly from wine grape production, although sometimes combined on the same premises. Grape (vineyard) production requires a different set of inputs and receives revenue based on production tonnage (crush volume). Wineries use grape crush as an input in the wine making process, and

receive revenue from the final sale of wine. Because of these differences, grape production (vineyard) is analyzed separately from wineries, and included in the crop production sector.

Santa Clara County boasts more than 40 **Farmers’ Markets** held on a weekly basis, generating important agritourism revenues for the county.

The Gilroy Garlic Festival generates over \$2 million in direct sales revenue and is attended by more than 100,000 people annually.





Support Industries

The support industries sector includes labor contractors, consulting and management service, and custom farming operations. County agricultural support industries have diminished over the years as farming and ranching has declined. Farm labor contractors are critical for modern agriculture, particularly in a county like Santa Clara with a high volume of labor intensive fresh fruit and vegetable production. Farm labor contractors act as a broker of agricultural labor, finding and facilitating stable work for farm laborers and providing employers with reliable and timely laborers to meet their staffing needs. Custom farming operations also serve a valuable function for core agricultural activities by offering a fee-for-hire service. These businesses fill a niche such as custom disking for weed management or custom harvesting with specialized equipment that individual farming operations cannot feasibly own themselves. Consulting and management services include vineyard management, a service that is used by many rural homeowners with small vineyards in the Santa Cruz Mountain communities of Los Altos, Saratoga, and Los Gatos.



Measure	Direct	Indirect	Induced	Total
Production	\$56 million	\$2.7 million	\$17.5 million	\$76 million
Value Added	\$52 million	\$2 million	\$13 million	\$67 million
Employment	1,040 jobs	15 jobs	135 jobs	1,190 jobs

- **Agricultural support industries is one of the highest value added industries in Santa Clara County. This sector relies primarily on direct hired labor, through farm labor contractors or custom farming operations, and salaries paid to these employees contribute directly to the Santa Clara County economy.**
- **The viability of the agricultural support industries sector directly depends on primary crop production in Santa Clara County. These businesses exist to serve core agricultural activities, and if these activities decline, or move outside of the county, the support industries sector contracts.**



Primary Processing

The primary processing sector includes those industries which directly process crop products in Santa Clara County. This includes both production that originates in the county and production that is sourced from elsewhere. Flower and seed wholesaling are included in this sector. In some instances, primary processing facilities are operated in conjunction with a farming operation. These industries process raw product into diced, pureed, roasted, pickled, canned, dried and dehydrated, and frozen and individually quick-frozen (IQF) products that often serve as an ingredient in a more complex product or are bound for food service. Processing facilities are capital intensive and the type of processing facilities changes as the crop mix in Santa Clara County changes, from prune dehydrators and tomato canneries to pepper processors and garlic dehydrators.

Measure	Direct	Indirect	Induced	Total
Production	\$334 million	\$74 million	\$50 million	\$458 million
Value Added	\$101 million	\$10 million	\$23 million	\$211 million
Employment	870 jobs	340 jobs	345 jobs	1,555 jobs

- **Primary processing includes flower and seed wholesaling, an important and growing industry in Santa Clara County. Seed production is also included in the primary crop production sector and as a primary input to the nurseries sector.**
- **The primary processing sector additionally includes research and development operations in Santa Clara County. Agricultural research and development is critical to achieving sustainable improvements in farm productivity. At a time when public funding for agricultural research and development has slowed, it is essential for private businesses to continue to innovate in order to meet growing world food demand.**





Food Manufacturing

The food manufacturing sector includes those industries which produce food products related to agriculture and may be partially sourced from other areas. These industries include fat and oil refining and blending, frozen fruits, juices and vegetable manufacturing, frozen specialties manufacturing, canned fruit and vegetable manufacturing, canned specialties, cheese manufacturing, animal (excluding poultry) slaughtering, meat processed from carcasses, tortilla manufacturing, and all other food manufacturing. These industries may source raw product from Santa Clara County farmers and may also purchase processed product from Santa Clara County's primary processors. Food manufacturing is another link in the agricultural economy that benefits from local agricultural production.

Measure	Direct	Indirect	Induced	Total
Production	\$212 million	\$40 million	\$20 million	\$272 million
Value Added	\$38 million	\$26 million	\$13 million	\$77 million
Employment	525 jobs	180 jobs	140 jobs	845 jobs



- The food manufacturing sector includes a number of different industries. Frozen product manufacturing was the highest value sub-sector, generating \$102 million in direct production value. Meat processing and slaughtering generated \$39 million in direct production value, cheese manufacturing generated \$29 million, and other miscellaneous food manufacturing generated \$42 million.
- The food manufacturing sector sources a portion of inputs from outside of Santa Clara County. As such, this sector does not depend on primary crop production in Santa Clara County as much as the other sectors included in the analysis.

Ecosystem Services

Ecosystem services provide value to residents but there is no market where they can be directly bought and sold. The value of ecosystem services is established using alternative methods. For example, open space is not sold, but it is common knowledge that houses with a good view will sell for a higher price. Economists use this to estimate the value of open space. This study does not include a primary analysis of ecosystem service values and instead relies on a meta-analysis of primary studies completed in other areas.

Flood control and land subsidence were motivating factors for the formation of a water management agency in the county. Agencies sought to prevent costly and widespread flooding and subsidence due to groundwater overdraft.

Agricultural fields can provide a space for short-term flooding, and provide the same degree of flood control while avoiding expensive levees and dykes. The value of flood control is estimated between \$40 and \$85 per acre farmed.

The deep percolation of irrigation water applied to the fields provides additional recharge over and above natural recharge. While the average irrigation system in Santa Clara County has a high water use efficiency, there will always be the need for some deep percolation to maintain water quality in the crop root zone. The value of this recharge is estimated between \$55 and \$70 acre.

The third water based ecosystem service provided by crop production is improved water quality from stabilization of erosion, filtering by boundary irrigation ditches, and beneficial biological action. The estimated value of water quality is \$25 to \$30 per acre.

Pollination and biodiversity measure the habitat value of agricultural land. Such biodiversity benefits are extremely hard to estimate because most people are unable to precisely define different levels of biodiversity and the corresponding value. Pollination and biodiversity values are estimated between \$20 and \$65 per acre.

Value Open space on or near the rural-urban fringe is critical in the county. A study of open space values in Southern California concluded that rangeland provided more open space benefits than cropland. Taken together, the estimated range is \$450 - \$1,000 per acre.

Clearly a justification for the agricultural resource base of land and water in Santa Clara County to urban county residents should be based on more than the value of agricultural production and employment generation. Not only is agriculture profitable, growing, and providing jobs, but it also generates self-financing ecosystem service benefits for county residents.

Service	Low Value per acre	High Value per acre
Flood Control	\$40	\$85
Recharge	\$55	\$70
Water Quality	\$25	\$30
Pollination	\$20	\$65
Biodiversity	\$20	\$30
Open Space	\$450	\$1,000

Acknowledgements

The project team at ERA Economics was fortunate to receive excellent input, data, and feedback from key stakeholders in Santa Clara County. We very much appreciate their genuine enthusiasm for the project and timely response to prying questions by our team. In particular, we wish to thank (and others we may have missed!):

Joe Deviney, Eric Wylde, Lori Oleson, Gary Meyer; Santa Clara County Division of Agriculture

Erin Gil; Santa Clara County Farm Bureau

Dhruv Khanna; Kirigin Cellars

George Guglielmo; Guglielmo Winery

David Gates; Ridge Vineyards

Jan Garrod; Cooper-Garrod Vineyard/Garrod Farms

Justin Fields; Santa Clara County Cattlemen's Association

Janet Burback; Tilton Ranch

Kevin O'Day; Retired Agricultural Commissioner, Rancher

Chris Chavez, Richard Rico; Global Mushrooms

Don Hordness; Del Fresh Produce

Robert Van Tassel; Royal Oaks Mushroom Farm

Matt Barerras; Monterey Mushrooms

Tim Chiala; George Chiala Farms/Nature Quality

Mike Mantelli; Christopher Ranch

Joe Benson; Syngenta

Andreas Olbring; Syngenta Flowers

Justin Davis; Sakata Seeds

Mike Bushman; Headstart Nursery

Bill Blocher; Western Tree Nursery

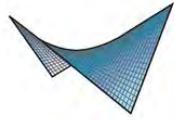
Haydi Boething Danielson; Boething Treeland Farms

Jake Smith; Santa Clara County Open Space Authority

Aziz Baameur, Sheila Barry, LeeAnn Ray; University of California Cooperative Extension

**Special thanks to Estela Cabral de Lara; Santa Clara County Division of Agriculture,
for assisting with editing and design**





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