CENTER OF EXCELLENCE
FOR LABOR MARKET RESEARCH

POWERED BY
California Community Colleges

Growing the Future

ADDRESSING WORKFORCE NEEDS IN CALIFORNIA'S SPECIALTY CROP INDUSTRIES

COE FOR LABOR MARKET RESEARCH

Prepared by
Center of Excellence for Labor Market Research

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NOTE FROM THE AUTHORS

Dear Reader,

This report, *Growing the Future: Addressing Workforce Needs in California's Specialty Crop Industries,* presents the findings of a comprehensive study of workforce trends, occupational demand, and education and training alignment within one of California's most vital sectors—agriculture. It draws upon secondary labor market data and primary research through employer surveys to identify emerging needs and systemic gaps.

It is important to note that all data and analysis presented in this report are based on information collected prior to February 2025. Since that time, significant national and international policy developments—including changes to agricultural tariffs, shifts in federal funding, and evolving immigration policies—are likely to have impacted both the economic outlook for specialty crop products and the availability of labor to support, harvest, and process these crops.

While the analysis in the report offers critical insights into California's specialty crop workforce as it stood in late 2024, we recognize that new challenges and opportunities have likely emerged since then. We encourage readers to consider the findings in this report as a foundation for ongoing dialogue and action, and we hope it will inform continued investment in a workforce system that is resilient, responsive, and inclusive.

Sincerely,

COE for Labor Market Research

EXECUTIVE SUMMARY

This report presents a comprehensive workforce assessment for California's specialty crop industries, revealing missed opportunities between labor market demand and the state's K-12, adult education, and community college education and training offerings. While overall employment in specialty crops is projected to grow modestly over the next five years, the growth is unevenly distributed across the state's five agricultural regions and industry subsectors. The support and processing sectors are expected to drive new job creation, while employment levels reported for crop production continue to decline.

The South Central/Inland and South San Joaquin Valley regions collectively account for more than 65% of the state's specialty crop employment, yet these regions experience significant disparities in training availability and access. In particular, the Central Valley exhibits high production volumes but lags in related training infrastructure. Conversely, while some northern and coastal regions maintain relatively stronger training-to-employment ratios, they still face mismatches in occupational focus – such as emphasizing agricultural mechanics over plant science – and program resilience.

Among emerging trends, the demand for skilled workers in equipment operation, food safety, machinery maintenance, and quality assurance is on the rise, especially in support and processing sectors. Yet, education and training offerings may be too few or too slow to change, and may not reflect the certifications or delivery models that are important to employers.

Employer reliance on informal recruitment practices further obscures hiring needs. The lack of job postings underrepresent demand, especially for production roles, and informal hiring (e.g., word-of-mouth) limits visibility of workforce needs to job seekers and workforce planners.

The wine grape sector, historically projected for modest growth, now faces serious market challenges. Declining consumer demand has resulted in the abandonment of vineyards, acreage conversion, and oversupply, rendering workforce projections based on past performance somewhat outdated.[1] Training programs that have historically focused on viticulture or hospitality related to viticulture may need to evaluate enrollment strategies or adjust their program offerings in response to shifting market conditions.

The report also emphasizes the importance of upskilling the existing labor force. Many in-demand jobs in agriculture do not require traditional postsecondary degrees or certificates and could instead be supported through short-term, applied training and credentialing. However, employers report persistent barriers to worker advancement, including limited transportation options, language barriers, and a lack of flexible training schedules.

To address these challenges, this report provides targeted recommendations:

- **Policymakers** are urged to align funding and programmatic oversight with real-time market conditions, support the development of regionally responsive training programs, and expand investment in flexible delivery formats.
- **Industry employers** are encouraged to engage in partnerships with education providers, participate in the co-design of training materials, and support upskilling through paid release time, mentorship, and apprenticeships.
- **Education and training providers** should adopt hybrid and modular training models, embed industry-recognized credentials into programs, and expand offerings in high-demand regions and occupational clusters.

Overall, industry needs do not seem aligned with California's training infrastructure. Demand for technical roles—such as equipment mechanics, quality assurance, food safety, and advanced machine operation is projected to continue rising in regions like the Central Valley and Coastal North. However, educational capacity lags behind, particularly in specialized pathways.

To bridge this gap, the workforce development strategy must pivot quickly: upskill existing employees through scalable, flexible training models; refocus resources from declining sectors; and foster public-private coordination to ensure that training is both geographically and occupationally proportional to demand. Addressing delivery challenges—such as wage support, flexible scheduling, and access—will be essential to meeting the evolving needs of California's specialty crop industry workforce.

Ultimately, California's agriculture labor market requires a more agile, inclusive, and regionally tailored approach to workforce development. By modernizing and rebalancing its training systems, the state can ensure a resilient and competitive workforce for the future.

INTRODUCTION

This report provides a comprehensive overview of the Specialty Crop industry's workforce needs across California. The specialty crops industry is a subsector of the greater Agriculture, Forestry, Fishing, and Hunting Sector. The United States Department of Agriculture (USDA) defines specialty crops as "fruits and vegetables, tree nuts, dried fruits and horticulture and nursery crops, including floriculture" that are "cultivated for either sale or for subsistence.[2]" This definition of specialty crops excludes oil seed crops, field and grain crops, forage crops, fiber crops, and animal production industries comprising the broader agricultural sector.[3]

With its mild Mediterranean climate, California is uniquely capable of growing a variety of specialty crops, producing over 400 agricultural commodities in total.[4] California's temperate climate, fertile soil, and water storage and delivery network combine to make it the nation's most productive agricultural region.[5] In 2022, the 63,134 Californian farms generated approximately $59 billion in sales.[6] Nearly 13% of the United States' agricultural exports come from California, generating $23.6 billion in exports in 2022.[7] Approximately 61% of U.S. fruit and nut crops come from California.[8] Additionally, many agricultural commodities and specialty crops are grown exclusively in California, accounting for 99% of the nation's exported "almonds, artichokes, figs, garlic, kiwifruit, olives and olive oil, pistachios, plums, prunes, raisins, table grapes, tomatoes for processing, and walnuts.[9]" Nearly two-thirds of the state's agricultural sales were from specialty crops, $38.7 billion.[10]

California's agricultural production dominance results from advantageous environmental conditions and a workforce that supplies the nation and globe with specialty crops. Specialty crop farming is labor-intensive, often "requiring harvest workers to distinguish ripe and unripe fruits and vegetables accurately and to gently pick, sort, or package the fruit or vegetable by hand without damaging it.[11]" For example, while only six in 10 California farms are dedicated to specialty crop production, specialty crop farms account for 93% of all farmworker employment.[12] As a result, specialty crop farmers are particularly susceptible to changes in the labor supply, spending nearly 40% of total cash expenses on farm labor, compared to 14% for other crops and livestock farms.[13] Other field crops, such as corn and soybeans, which do not require the same care as specialty crops, have lower labor expenses because of technological adoptions and innovations in automation.[14]

California's specialty crop farmers have difficulty attracting new farm laborers due to the seasonal work and physically demanding work historically associated with employment in this sector.[15]

While the adoption of robotics and unmanned aerial systems are may address some of the labor shortage concerns in this industry, technological advancements will likely change the type of work activities required for this labor-intensive sector.[16] According to a DOL survey, approximately 17% of California farmworkers held a non-crop job during the previous year, with 35% of these workers performing mechanic, repair, or maintenance activities.[17] While these workers may possess the skills needed to service automated machinery, further training is likely needed to increase the supply of qualified workers on specialty crop farms moving forward. Given that 82% of California farmworkers expect to continue doing farm work for at least the next five years, identifying what skills are highest priority and how to deliver training to the current workforce is paramount to meeting the needs of employers and for the industry to continue to thrive in the state.[18]

METHODOLOGY

This study takes a comprehensive approach to evaluating employment trends in California's specialty crop industry.

Industry Employment

The COE conducted a thorough review of existing literature on agriculture and specialty crop employment. Additionally, the COE developed a methodology to estimate employment in crop production and processing by county and type, utilizing employment data from Lightcast and California's Labor Market Information Division. This approach enabled the estimation of specialty crop employment within the broader crop production sector, while also identifying historical trends and projecting future employment patterns where data was available.

Job Postings Analysis

The COE analyzed employer job postings to evaluate the demand for specialty crop workers. Since the industry relies less on job advertisements, given that most farmworkers secure jobs through referrals, job postings may not fully capture actual employment demand. By gathering and categorizing job postings from the past year, the COE identified distinct industry groups and examined geographic hiring trends.

Occupational Employment

To identify key occupations within specialty crop production and processing, the COE leveraged staffing patterns and other analytical methods. These staffing patterns facilitated employment estimations across the agricultural sector, including specialty crops. This section presents an analysis of occupational data from Lightcast, covering job counts, projected demand, wages, and education requirements.

Educational Pathway Analysis

For this section, the COE utilized the California Community Colleges sector definitions and the California Department of Education's Career Technical Education (CTE) framework to map educational pathways relevant to entry-level employment in specialty crops. The COE examined existing educational programs at community colleges and four-year institutions to estimate the supply of new workforce entrants.

Additionally, the COE reviewed K-12 and adult education programs to identify and quantify agriculture education pathways. However, due to the lack of available data on adult education completions by program pathway and the continuation rates of K-12 students in agricultural pathways, the inclusion of these programs in supply estimates was limited.

Employer Survey

To assess the workforce needs of California's specialty crop industry, the COE conducted the Specialty Crops Workforce Survey, targeting employers across the sector. The survey gathered data on the most frequently employed occupational roles, recruitment and professional development practices, and emerging workforce demands. These findings provide critical input for the design of targeted workforce training programs that address the evolving labor requirements of the specialty crop industry in California.

INDUSTRY EMPLOYMENT

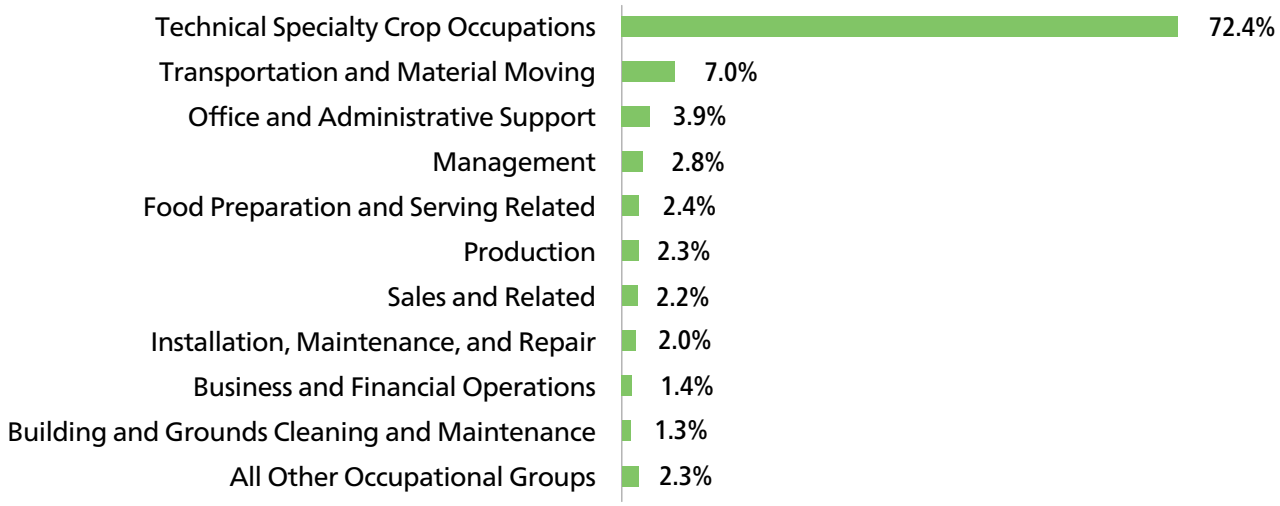
The specialty crop industry remains a cornerstone of California agriculture, comprising approximately 507,000 jobs in 2023. The largest occupational shares fall within farmworker roles, crop support services, and production management. While historical trends show slow but steady industry growth, crop production employment has declined over the last decade, losing nearly 18,800 jobs. This decline is offset by job growth in the support and processing sectors, which are projected to drive employment gains through 2028. However, the uneven growth across sectors complicates workforce training responses, especially as training programs remain heavily concentrated in traditional production areas.

The North American Industry Classification System (NAICS) is a hierarchical classification system that categorizes establishments based on the primary activity, and, therefore, an industry is a collection of businesses engaged in a similar economic activity. While businesses may engage in activities that can be classified in multiple industries, businesses are assigned one NAICS code in which all company employment is quantified. For example, industrywide employment estimates often "include support personnel on farms, such as human resource managers, sales agents, and truck drivers.[19]" As a result, industry employment information likely overcounts the number of workers engaged in a business's primary activity. For example, approximately 10% of specialty crop industry employment is related to traditional business roles, such as management, marketing, sales, and human resources.

Exhibit 1 displays the staffing pattern for the specialty crop industry by major occupational group to provide insight into the distribution of jobs by work activity. The 13 smallest occupational groups were combined and are displayed in the exhibit below as All Other Occupational Groups, totaling 2.3% of industry jobs. Approximately 72% of industry jobs are related to technical occupations that engage in the primary business activities of the specialty crop industry. Industry employment is highly concentrated in the top three technical occupations: farmworkers and laborers, crop, nursery, and greenhouse; farmers, ranchers, and other agricultural managers; and farmworkers, farm, ranch, and aquacultural animals, which account for nearly 56% of industry jobs combined. The COE's Specialty Crops Workforce Survey confirmed the importance of these three

technical occupations, with approximately 89% of survey respondents who reported workforce data by occupation indicating that they employ at least one of them. Staffing patterns also reveal that seven percent of industry jobs are employed in positions responsible for the transportation and distribution of specialty crops.

Exhibit 1. Specialty crop industry employment by major occupational group, California, 2023

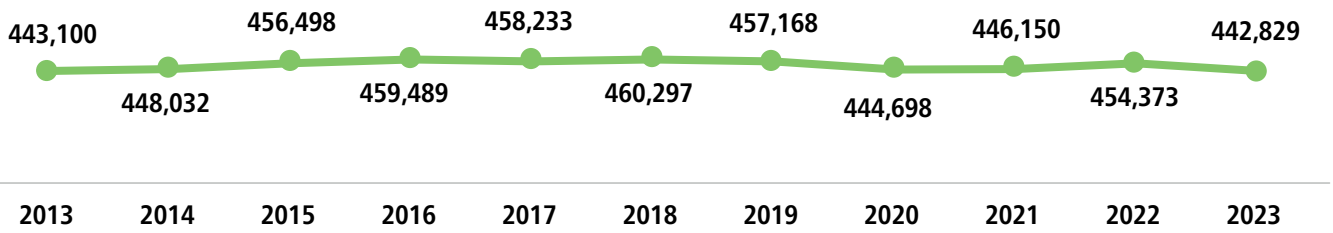


Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Agriculture, Forestry, Fishing, and Hunting Employment

Specialty crop employment is largely contained within the Agriculture, Forestry, Fishing, and Hunting (11) sector, which comprises establishes primarily engaged in growing crops, raising animals, harvesting timber, and harvesting fish and other animals from a farm, ranch, or their natural habitats.[20] California's agricultural sector employed more than 442,800 jobs in 2023, or approximately 2.2% of the state's workforce. California employs approximately 22% of the nation's agricultural workforce, demonstrating the importance of California agriculture in the United States. Exhibit 2 displays California's agricultural employment over the last ten years, 2013 to 2023. Over the last ten years, agricultural employment in California has remained relatively flat, shedding 271 jobs. Over this same period, United States agricultural employment grew by 1.8%, adding more than 35,100 jobs.

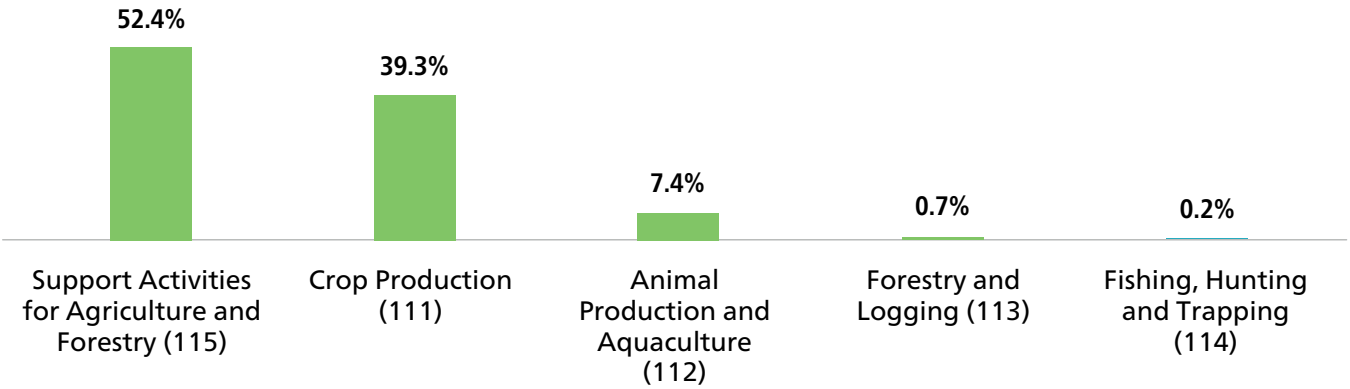
Exhibit 2. Historical agriculture sector employment, California, 2013-2023



Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

The hierarchical nature of NAICS allows for the disaggregation of employment data to derive insight into industry employment by activity type. The Agriculture, Forestry, Fishing and Hunting Sector (11) is comprised of Crop Production (111), Animal Production and Aquaculture (112), Forestry and Logging (113), Fishing, Hunting, and Tracking (114), and Support Activities for Agriculture and Forestry (115). In 2023, approximately 92% of agricultural jobs were employed by industry groups related to specialty crops, such as support activities for agriculture and forestry and crop production. Exhibit 3 displays the shares of employment in the agricultural sector by broad industry group in 2023.

Exhibit 3. Share of agriculture sector employment by industry group, California, 2023



Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Over the next five years, the California agriculture sector is projected to increase employment by 3.5%, adding nearly 15,300 jobs. Agricultural employment growth in California is projected to outpace national agricultural employment growth over the next five years at 2.6%. Agriculture employment growth in California is largely driven by the support activities for the agriculture and forestry industry, which is projected to add 16,372 jobs, growing by 7.1%. Exhibit 4 displays employment growth in California's agricultural sector over the next five years.

Exhibit 4. **Projected agriculture sector employment, California, 2023-2028**

Industry (NAICS)	2023 Jobs	2028 Jobs	2023-2028 Change	2023-2028 % Change
Crop Production (111)	174,116	174,817	701	0.4%
Animal Production and Aquaculture (112)	32,746	31,096	(1,649)	(5.0%)
Forestry and Logging (113)	3,029	3,028	(0)	0.0%
Fishing, Hunting and Trapping (114)	1,094	968	(125)	(11.5%)
Support Activities for Agriculture and Forestry (115)	231,846	248,217	16,372	7.1%
Agriculture, Forestry, Fishing and Hunting Sector (11)	**442,829**	**458,127**	**15,298**	**3.5%**

Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Specialty Crop Industry Employment

The majority of specialty crop employment is captured in the Agriculture, Forestry, Fishing, and Hunting sector. However, there are other industries with significant employment related to specialty crops. This report aims to take a holistic approach to quantifying employment in the specialty crop sector by including data and other information related to crop support and processing industries.

While farming businesses are primarily engaged with growing crops, an array of businesses assists farmers in cultivating, harvesting, and processing crops. This report separates specialty crop industry employment by work activities into three groups: crop production, crop support, and crop processing. According to a survey of California farmworkers, 33% of workers perform technical production tasks, 25% perform pre-harvest tasks, 23% harvest crops, and 19% perform post-harvest tasks.[21]

The USDA defines the specialty crop sector by listing the crops and crop types produced and processed. Since businesses are classified by their economic activity, crop production industries (111) are often characterized by the crops farmed, such as Potato Farming (111211), Strawberry Farming (111333), and Tree Nut Farming (111335), for instance. All industries defined by the product grown are categorized in this report as specialty crop production industries.

Industries that support specialty crop production through farm labor management, as well as plowing, fertilizing, planting, cultivating, harvesting, crop protection, and postharvest activities, are classified as specialty crop support industries. While most farmworkers are hired directly by farmers, "some are employees of agricultural service companies, including farm labor contractors, custom harvest providers, and management service providers.[22]" Employment estimates for workers employed by labor contractors are captured in the specialty crop support industries. In California, about seven in 10 farmworkers are employed directly by growers, while the remaining 28% are employed by farm labor contractors, according to the DOL.[23]

Of the 175 employers, representing over 17,900 employees, who identified their primary function in the COE's Specialty Crops Workforce Survey, 78% consider their primary function to be crop production, followed by crop support and crop processing, with 16% and 6% of respondents identifying these activities as their organizations' primary function, respectively. Close to half (48%) of survey respondents listed crop support activities as their organization's secondary function, followed by crop production and crop processing, at 35% and 17%, respectively.

The food processing functions integral to the specialty crop industry are defined as businesses responsible for converting harvested crops into food and beverage products. Businesses processing specialty crops are classified as manufacturing firms and recorded in employment data as such. For a food or beverage product to maintain its specialty crop status, the final product must comprise at least 50% specialty crop by weight.[24] The food processing industries in this report produce products that maintain their specialty crop status.

California crop production is frequently vertically integrated across food production and processing to maintain food quality and mitigate supply chain issues.[25] California's food processing industry is the largest in the nation, with 3,421 establishments employing 198,000 workers and generating $25.2 billion in value for the state.[26]

Exhibit 5 displays current and projected employment in California by specialty crop industry groups. In 2023, there were nearly 17,900 establishments in the specialty crop industry, accounting for about 507,000 jobs.

- Approximately 64% of the establishments were producers, 21% were support, and 15% were processors.
- Production and support industry groups account for most of the employment (85% or about 431,000 jobs).
- Employment is projected to grow by 4.1% through 2028, creating as many as 20,700 new jobs.
- More than 60% of the employment growth projected through 2028 is expected to generate from farm labor contractors and crew leaders.

Exhibit 5. Specialty crop detailed industry employment, California, 2023-2028

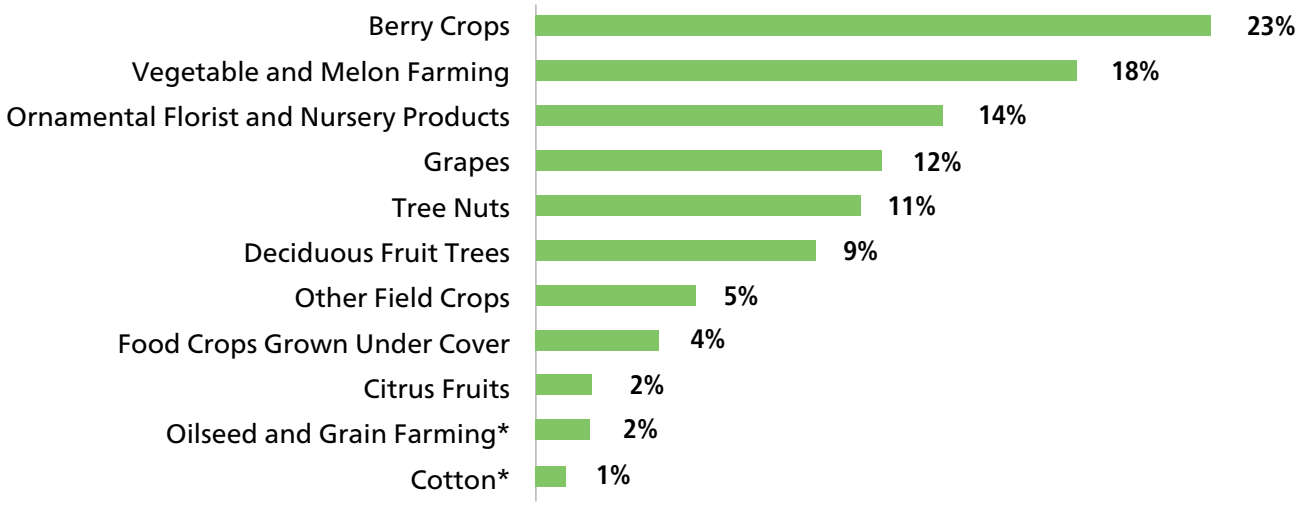
Industry (NAICS)	2023 Jobs	2023 - 2028 Change	2023 - 2028 % Change	Average Earnings Per Job
Crop Production (111000)*	174,116	701	0.4%	$60,413
Animal Production and Aquaculture (112000)*	32,746	(1,649)	(5.0%)	$69,422
Forest Nurseries and Gathering of Forest Products (113210)	430	4	0.9%	$68,108
Specialty Crop Production Subtotal	**207,292**	**(944)**	**(0.5%)**	**$61,852**
Soil Preparation, Planting, and Cultivating (115112)	11,440	(210)	(1.8%)	$66,230
Crop Harvesting, Primarily by Machine (115113)	6,034	234	3.9%	$59,888
Postharvest Crop Activities (except Cotton Ginning) (115114)	39,424	1,825	4.6%	$71,547
Farm Labor Contractors and Crew Leaders (115115)	155,566	13,208	8.5%	$43,805
Farm Management Services (115116)	12,214	942	7.7%	$66,633
Specialty Crop Support Subtotal	**224,678**	**15,999**	**7.1%**	**$51,488**
Frozen Fruit, Juice, and Vegetable Manufacturing (311411)	3,743	(87)	(2.3%)	$82,518
Fruit and Vegetable Canning (311421)	12,970	151	1.2%	$77,685
Dried and Dehydrated Food Manufacturing (311423)	3,563	122	3.4%	$75,343
Perishable Prepared Food Manufacturing (311991)	12,845	1,976	15.4%	$64,049
Wineries (312130)	41,950	3,497	8.3%	$91,369
Specialty Crop Processing Subtotal	**75,072**	**5,658**	**7.5%**	**$83,128**
Specialty Crop Totals	**507,042**	**20,713**	**4.1%**	**$60,410**

Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed. *Detailed industry data unavailable.

Employment in the agriculture industry is collected alternatively from all other industry employment (also referred to as nonfarm industry employment). As a result, detailed crop and animal production industry data is not available in Lightcast, the proprietary labor market data source utilized in this report. Only data aggregated to broader industry codes are available for the crop and animal production industries. However, employment data from the California Employment Development Department's Labor Market Information Division (EDD/LMID) provides greater insight into specialty crop production industry employment shares by crop type. Exhibit 6 displays shares of Crop Production (111) industry employment by crop type or group.

Detailed industry data reveals that approximately 97% of statewide crop production employment is related to the production of specialty crops. Less than 3% of statewide crop production employment is related to non-specialty crop production, farming cotton, grain, and oilseed. More than half of California's Crop Production (111) employment is dedicated to producing berry crops, vegetable and melon crops, and ornamental florist and nursery products.

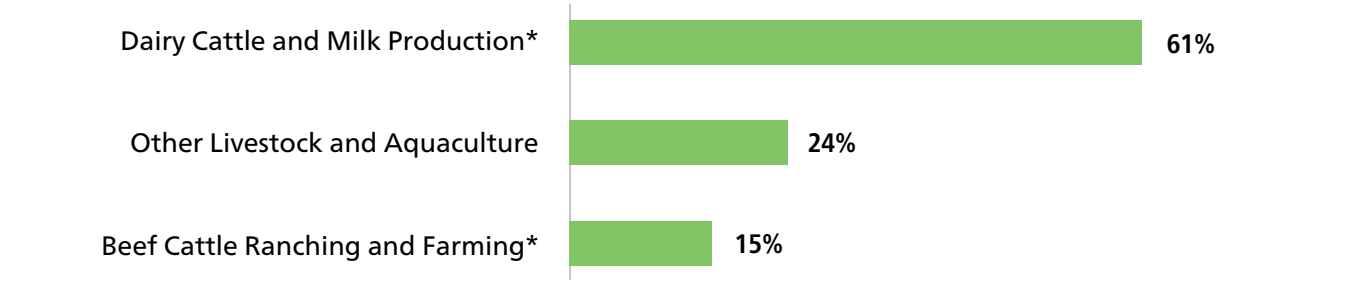
Exhibit 6. Share of crop production employment by crop type, California, 2023



Source: California Employment Development Department Labor Market Information Division. *Not a specialty crop.

Employment data for the broad industry of Animal Production and Aquaculture (112) is provided in this report to capture employment data for aquatic plants and apiculture. Aquatic plants such as bladderwrack (seaweed) or watercress, and honey are specialty crops whose employment is captured by the detailed industries Other Aquaculture (112519) and Apiculture (112910), respectively. Due to limitations in data collection, information for the broad industry, Animal Production and Aquaculture (112), is provided in this report to ensure the entirety of specialty crop production employment is captured. It should be noted that approximately 76% of animal production and aquaculture employment is not related to specialty crops. Aquaculture and apiculture employment is captured by the other livestock and aquaculture industry group, which accounts for 24% of animal production employment. However, this industry group comprises 16 detailed industries, indicating that aquaculture and apiculture employment comprises a small share of animal production and aquaculture industry employment.

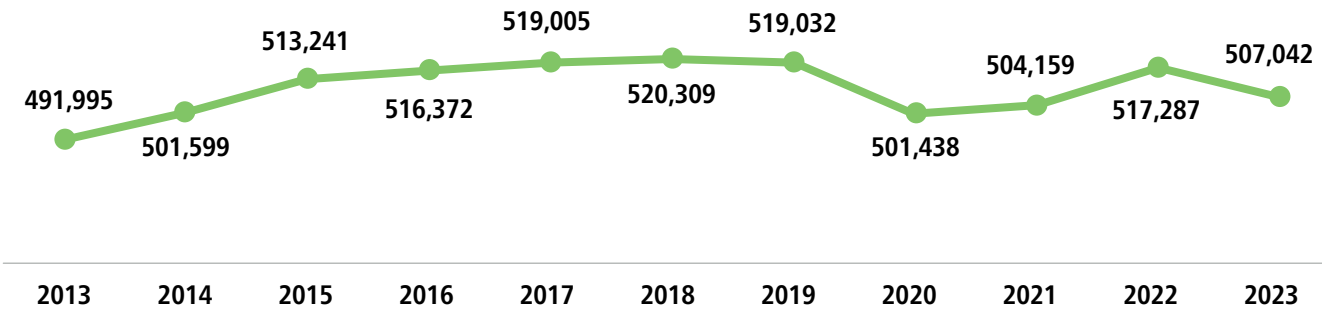
Exhibit 7. Share of animal production and aquaculture employment by detailed industry group, California, 2023



Source: California Employment Development Department Labor Market Information Division. *Not a specialty crop.

Exhibit 8 displays total specialty crop industry employment over the last ten years. Between 2013 and 2023, the specialty crop industry has grown by 3%, adding more than 15,000 jobs. Specialty crop industry employment growth has outpaced employment growth in the Agriculture, Forestry, Fishing, and Hunting Sector, which remained flat over the past ten years, shedding 271 jobs.

Exhibit 8. Specialty crop industry employment, California, 2013-2023



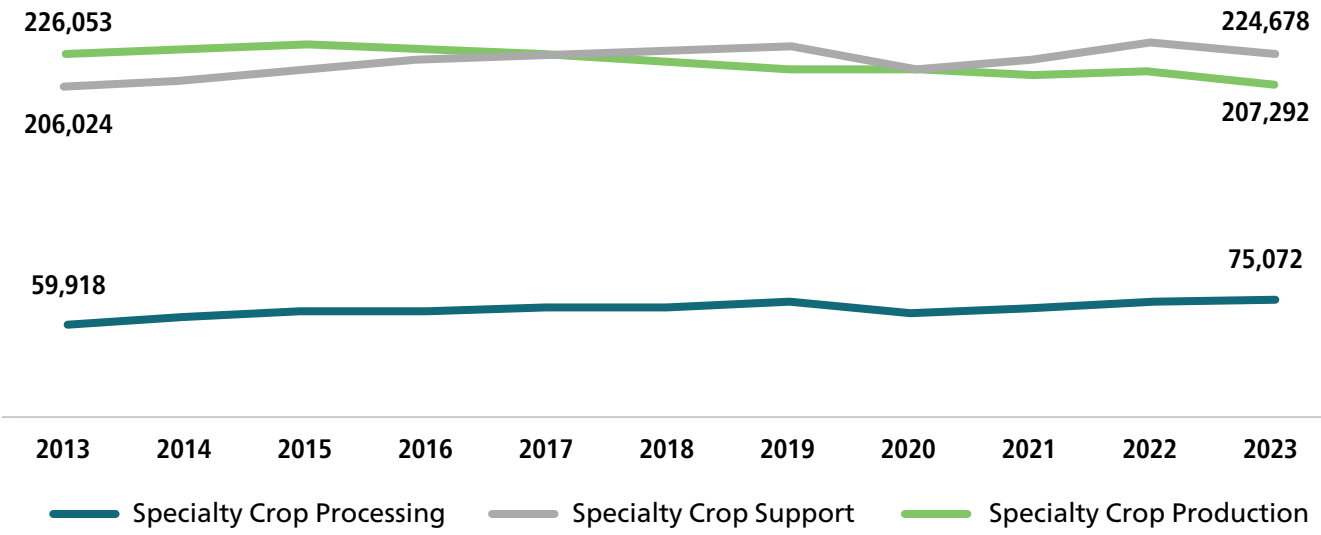
Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Exhibit 9 displays employment by specialty crop industry groups over the last ten years in California. In 2023, approximately 44.3% of statewide specialty crop jobs were employed in the crop support industry group, followed by the crop production industry group at 40.9%. The specialty crop processing industry is the smallest by employment, accounting for 14.8% of statewide specialty crop employment. Over the last ten years, the specialty crop support industry group emerged as the largest industry group in terms of employment, exceeding specialty crop production employment.

The specialty crop production industry group lost nearly 18,800 jobs over the last ten years, declining by 8.3%. Since the production industry group has contracted over the last ten years, total specialty crop employment gains are a product of employment gains in the processing and support industries. The specialty crop processing industry group grew by more than 25% over the last ten years, adding nearly 15,200 jobs. The specialty crop support industry group added the most jobs over this timeframe, growing employment by nearly 18,700 jobs or 9.1%.

Source: Cal-PASS Plus LaunchBoard, Strong Workforce Program

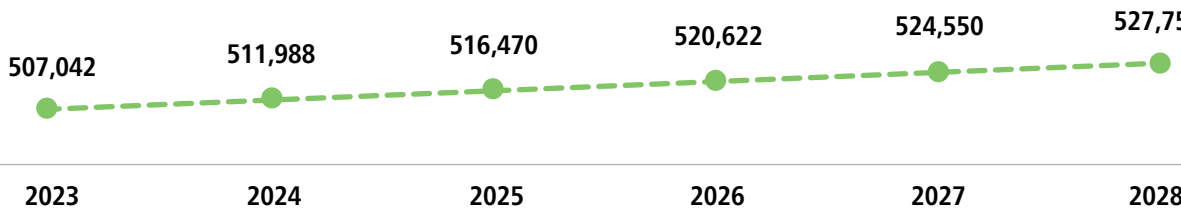
Exhibit 9. Specialty crop employment by industry group, California, 2013-2023



Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Exhibit 10 displays projected specialty crop industry employment from 2023 to 2028 in California. Over this period, the specialty crop industry, as a whole, is projected to grow by 4.1%, adding over 20,700 jobs. Industry employment projections align with historical patterns, in which crop support and crop processing activities are expected to be the drivers of industry job growth, while crop production employment is projected to shrink. Exhibit 11 displays how employment is projected to change by specialty crop activity. While specialty crop industry employment is projected to outpace the employment growth of the broader agricultural sector at 3.5%, the growth rate of the specialty crop industry is less than the statewide average of 6.9% growth across industries.

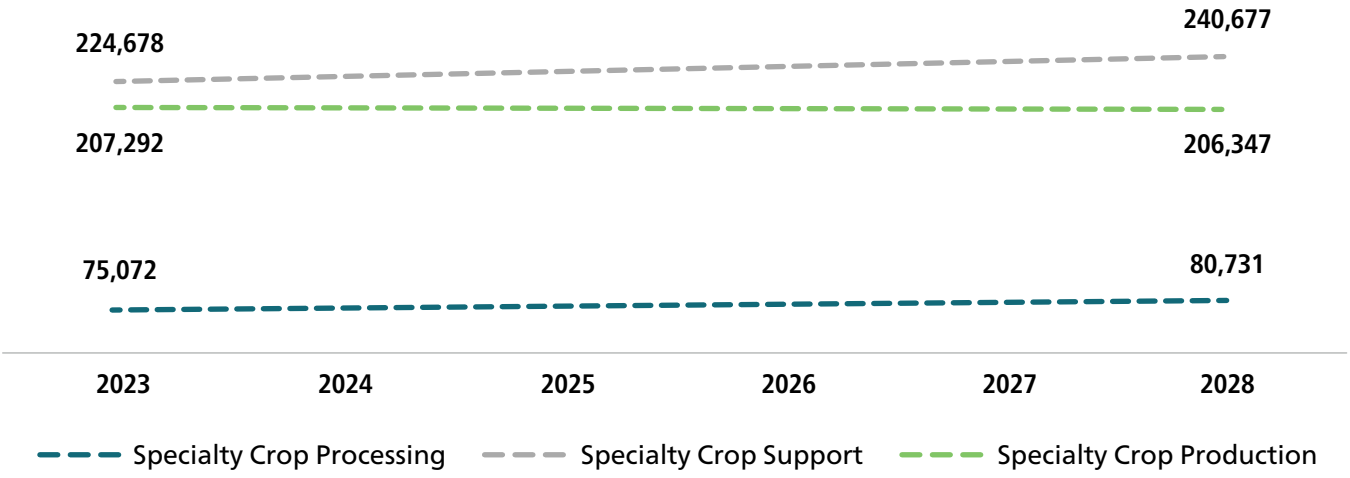
Exhibit 10. Projected specialty crop industry employment, California, 2023-2028



Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Exhibit 11 displays projected employment in California's specialty crop industry groups over the next five years. Between 2023 and 2028, the specialty crop support industry group is projected to add the most jobs, growing by 7.1% or nearly 16,000 jobs. The specialty crop processing industry has the highest growth rate, growing by 7.5% or nearly 5,700 jobs over the next five years. Employment in the specialty crop production group is projected to decrease by 0.5% by 2028, losing more than 900 jobs.

Exhibit 11. Projected employment by specialty crop industry group, California, 2023-2028



Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

REGIONAL INDUSTRY EMPLOYMENT

In 2023, specialty crop employment in California was highly concentrated in the South Central/Inland and South San Joaquin Valley regions, which together accounted for over 65% of all specialty crop jobs. The remaining workforce was distributed among the North State/Bay Area (14.5%), North San Joaquin/Coastal (12.0%), and Southern (7.8%) regions, with the Southern Region representing the smallest share of statewide specialty crop employment.

The California Department of Food and Agriculture's (CDFA) Specialty Crop Workforce Development Program divides California's vast agricultural land into five geographic regions.[27]

- Region 1: North State/Bay Area
- Region 2: North San Joaquin/Coastal
- Region 3: South Central/Inland
- Region 4: South San Joaquin Valley
- Region 5: Southern Region

The separation of California agriculture into specialty crop regions facilitates an in-depth analysis of how specialty crop employment varies throughout the state. Exhibit 12 displays the specialty crop workforce development program's agricultural region map. See Appendix C for a list of counties by region.

Exhibit 12. Specialty crop workforce development regional map, California, 2023

Source: California Department of Food and Agriculture.

Exhibit 13 displays the current share of specialty crop employment, projected employment, and average earnings per job by region. The South Central/Inland region contains approximately 40.9% of California's specialty crop employment, with more than 207,000 jobs in 2023. With only 7.8% of the State's specialty crop jobs, the Southern Region is the smallest specialty crop region in terms of employment. The South Central/Inland region is projected to remain the largest region in terms of employment over the next five years, adding nearly 14,900 jobs, growing by 7.2%. Following the South Central/Inland region, the North State/Bay Area region is projected to grow by 5.9%, adding nearly 4,400 jobs.

Exhibit 13. Current and projected employment by region, California, 2023-2028

Region	Statewide Employment Share	Establishment Count	2023 Jobs	2023 - 2028 Change	2023 - 2028 % Change	Average Earnings Per Job
North San Joaquin/Coastal	12.0%	3,070	60,713	108	0.2%	$69,677
North State/Bay Area	14.5%	4,940	73,604	4,355	5.9%	$75,047
South Central/Inland	40.9%	4,056	207,008	14,875	7.2%	$55,950
South San Joaquin Valley	24.8%	4,136	125,602	1,589	1.3%	$54,550
Southern Region	7.8%	1,542	39,471	(178)	(0.5%)	$60,126

Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

While regional employment totals provide insight into the distribution of specialty crop jobs throughout the state, more significant insights can be derived by analyzing the distribution of employment by specialty crop industry group. Exhibit 14 displays shares of crop production, support, and processing industry employment by region. Industry group data reveals a concentration of crop processing employment in the North San Joaquin/Coastal and North State/Bay Area regions, accounting for nearly 60% of statewide crop processing employment. Nearly 80% of statewide specialty crop support employment is located within the South Central/Inland and South San Joaquin Valley region.

Exhibit 14. **Shares of statewide industry group employment by region, California, 2023**

Region	Total Employment Share	Statewide Crop Production Employment Share	Statewide Crop Support Employment Share	Statewide Crop Processing Employment Share
North San Joaquin/Coastal	12.0%	13.4%	7.2%	22.6%
North State/Bay Area	14.5%	13.7%	8.2%	35.8%
South Central/Inland	40.9%	40.9%	47.0%	22.7%
South San Joaquin Valley	24.8%	22.0%	32.2%	10.4%
Southern Region	7.8%	10.0%	5.5%	8.4%
California	**100%**	**100%**	**100%**	**100%**

Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Exhibit 15 displays the regional shares of specialty crop industry group employment by region. At the state level, the crop support industry group is the largest industry group in the specialty crop industry (44.3%), followed by the crop production industry group (40.9%) and the specialty crop processing (14.8%). More than half of specialty crop employment in the Southern Central/Inland and South San Joaquin regions is in businesses that engage in crop support activities. More than half of specialty crop workers in the Southern Region are employed in specialty crop production industries.

Exhibit 15. **Shares of industry group employment by region, California, 2023**

Region	Statewide Crop Production Employment Share	Statewide Crop Support Employment Share	Statewide Crop Processing Employment Share	Total Employment Share
North San Joaquin/Coastal	45.6%	26.5%	27.9%	100%
North State/Bay Area	38.5%	25.0%	36.5%	100%
South Central/Inland	40.9%	50.9%	8.2%	100%
South San Joaquin Valley	36.3%	57.5%	6.2%	100%
Southern Region	52.6%	31.4%	16.0%	100%
California	**40.9%**	**44.3%**	**14.8%**	**100%**

Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

JOB POSTINGS ANALYSIS

Employer job postings indicate strong demand for workers in the processing sector, particularly for roles in wineries, food manufacturing, and packaging. However, due to low online job ad usage in production and support roles, actual hiring needs are underrepresented. Notably, occupations related to food safety, machinery, and equipment operation are highly sought, especially in support and processing firms. Employer survey results confirm that job postings only partially reflect workforce needs, as many employers rely on informal networks, labor contract firms, and internal promotions. Nonetheless, postings provide critical insight into skill and credential demands, which may not be fully addressed in existing training programs.

This section of the report analyzes advertisements (ads) to identify the distribution of employment demand across California and in the specialty crop industries. It should be noted that employers in the agricultural industry post fewer job ads per industry job than all other industries in California. A comparison of ads posted over the last year to industry employment confirms that agricultural employers post the fewest job ads. The ratio of 2023 jobs to job ads posted over the last year is 5.3 to 1 across all industries in California, while the ratio was 58.3 to 1 for the specialty crop industry. While job ads may not be an accurate reflection of the total employer demand for specialty crop workers, they may provide insight into the locations of employers posting job ads and the detailed industries in which they operate.

The Department of Labor survey found that 70% of farmworkers found their current job via referrals from friends or relatives,[28] representing a significant portion of employment demand not found in employer job ads. The COE's Specialty Crops Workforce Survey confirms the Department of Labor's findings, with only 35% of employers listing online job ads as a method of recruitment currently utilized by their organization. It should be noted that specialty crop processing employers are a part of the broader manufacturing sector, in which posting a greater number of job ads is frequent.

Specialty crop job ads were obtained by conducting a search for ads posted by employers in the specialty crop industry. Job ad information displayed in this section is separated by industry group to illuminate the detailed industries and regions most relevant to each industry group and to ensure that job ad information is not dominated by the crop processing industry group. Over the last 12 months, there were 2,422 job ads posted for workers in the specialty crop industry. Approximately 61% of specialty crop job ads were posted for specialty crop processing workers, despite being the smallest industry group in terms of employment. The limited number of job ads for specialty crop production and support workers could be a product of low industry turnover. Californian farmworkers stay with an employer for an average of eight years.[29]

Production Industry Job Advertisements

Over the last 12 months, between December 2023 and November 2024, there were 746 job advertisements posted for occupations in the specialty crop production industry. Exhibit 16 displays the number of specialty crop production job ads by detailed industry. Approximately two-thirds of specialty crop production job ads were concentrated in the top three industries, all other miscellaneous crop farming, nursery and tree production, and other vegetable and melon farming. Please note that job ads provide insight into the location and types of activities performed by specialty crop businesses, but do not communicate the actual scale of employment demand.

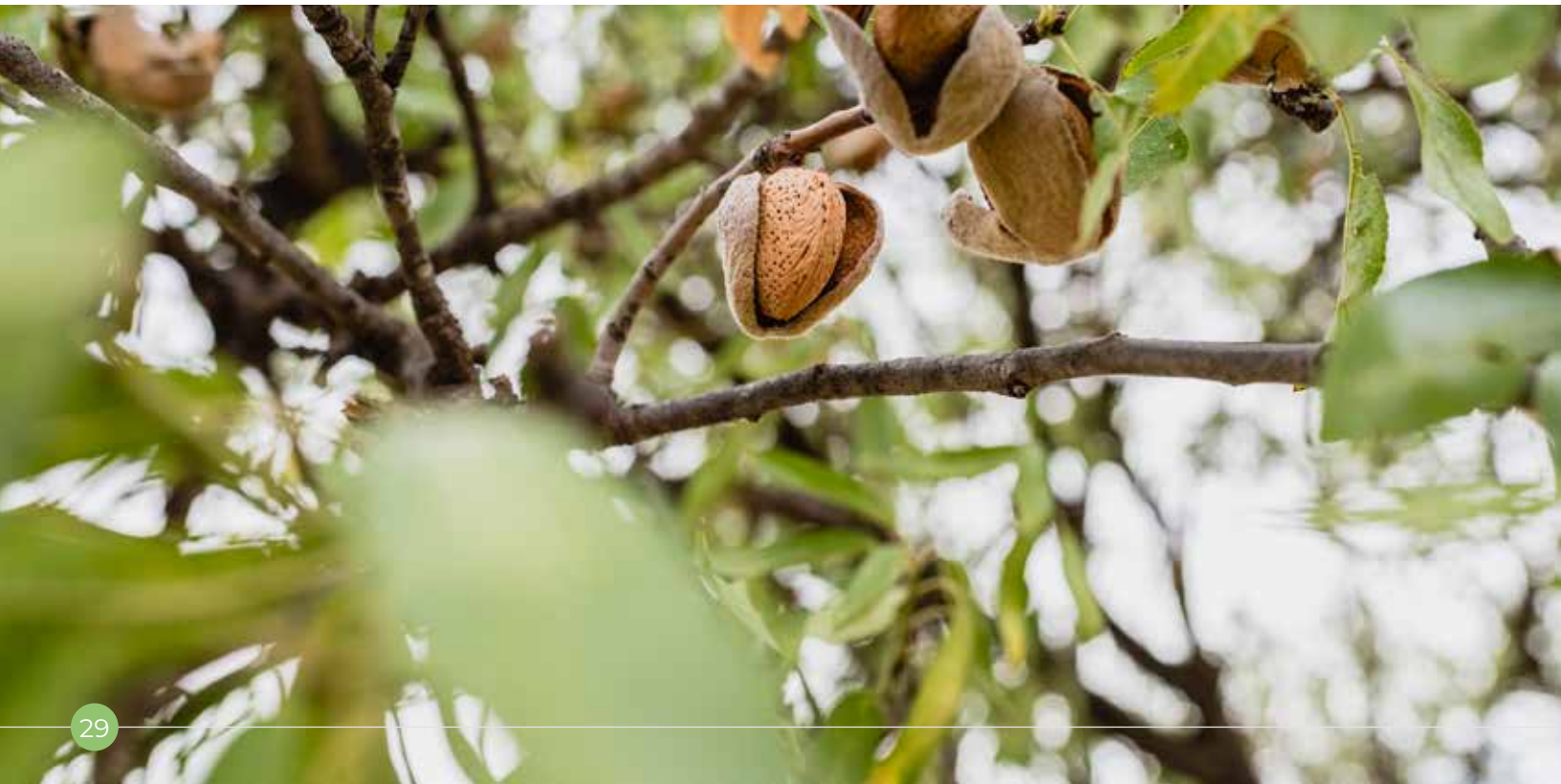


Exhibit 16. **Specialty crop production job ads by detailed industry, California, Dec 2023–Nov 2024**

Industry	Job Ad Count
All Other Miscellaneous Crop Farming	275
Nursery and Tree Production	134
Other Vegetable (except Potato) and Melon Farming	84
Grape Vineyards	72
Other Food Crops Grown Under Cover	31
Other Noncitrus Fruit Farming	30
Potato Farming	28
Citrus (except Orange) Groves	25
Tree Nut Farming	19
Fruit and Tree Nut Combination Farming	9
Floriculture Production	9
Orange Groves	7
Strawberry Farming	5
Mushroom Production	5
Apiculture	4
Forest Nurseries and Gathering of Forest Products	3
Apple Orchards	2
Berry (except Strawberry) Farming	2
Other Aquaculture	2
Specialty Crop Production Industry Group Total	**746**

Source: Lightcast.

Exhibit 17 displays the top ten cities with employers posting job ads for specialty crop production workers in California over the last 12 months. The cities displayed in the table below account for approximately 34% of all specialty crop production job ads in California.

Exhibit 17. Cities with the most job ads for specialty crop production workers, California, Dec 2023–Nov 2024

City (Region)	Job Ad Count
Delano (South Central/Inland)	60
Del Rey (South San Joaquin Valley)	31
Watsonville (North San Joaquin/Coastal)	26
Shafter (South Central/Inland)	24
Lost Hills (South Central/Inland)	23
Paso Robles (South Central/Inland)	20
Tehachapi (South Central/Inland)	20
Fresno (South San Joaquin Valley)	18
Fillmore (South Central/Inland)	17
Saint Helena (North State/Bay Area)	16
All Other Cities	491
Total	**746**

Source: Lightcast.

Support Industry Job Advertisements

Over the last 12 months, between December 2023 and November 2024, there were 190 ads posted for jobs in the specialty crop support industry. Exhibit 18 displays the number of specialty crop support job ads posted by detailed industry. Approximately 42% of specialty crop support job ads were concentrated in the postharvest crop activities industry, which includes employers engaged in the cleaning of crops, sun drying, shelling, fumigating, curing, sorting, grading, packing, and cooling. Nearly 34% of job ads were posted in the soil preparation, planting, and cultivating industry, with 64 job ads posted over the last 12 months. Please note that job ads provide insight into the location and types of activities performed by specialty crop businesses, but do not communicate the actual scale of employment demand.

Exhibit 18. Specialty crop support job ads by detailed industry, California, Dec 2023–Nov 2024

Industry	Job Ad Count
Postharvest Crop Activities (except Cotton Ginning)	80
Soil Preparation, Planting, and Cultivating	64
Farm Labor Contractors and Crew Leaders	28
Farm Management Services	11
Crop Harvesting, Primarily by Machine	7
Specialty Crop Support Industry Group Total	**190**

Source: Lightcast.

Exhibit 19 displays the top ten cities with employers posting job ads for specialty crop support workers in California over the last 12 months. The cities displayed in the table below account for approximately 54% of all specialty crop support job ads in California.

Exhibit 19. Cities with the most job ads for specialty crop support workers, California, Dec 2023–Nov 2024

City (Region)	Job Ad Count
Salinas (South Central/Inland)	21
Gustine (South San Joaquin Valley)	18
Santa Maria (South Central/Inland)	17
Hughson (North San Joaquin/Coastal)	12
Fresno (South San Joaquin Valley)	11
Stockton (North San Joaquin/Coastal)	6
Oxnard (South Central/Inland)	5
Ventura (South Central/Inland)	5
Arvin (South Central/Inland)	4
Napa (North State/Bay Area)	4
All Other Cities	87
Total	**190**

Source: Lightcast.

Processing Industry Job Advertisements

Over the last 12 months, between December 2023 and November 2024, there were 1,486 job ads posted for occupations in the specialty crop processing industry. Exhibit 20 displays the number of specialty crop support job ads by detailed industry. Approximately 49% of specialty crop processing job ads were concentrated in the wineries industry, comprised of businesses growing grapes and manufacturing wines. Please note that job ads provide insight into the location and types of activities performed by specialty crop businesses, but do not communicate the actual scale of employment demand.

Exhibit 20. Specialty crop processing job ads by detailed industry, California, Dec 2023–Nov 2024

Industry	Job Ad Count
Wineries	722
Frozen Fruit, Juice, and Vegetable Manufacturing	313
Fruit and Vegetable Canning	247
Perishable Prepared Food Manufacturing	135
Dried and Dehydrated Food Manufacturing	69
Specialty Crop Processing Industry Group Total	**1,486**

Source: Lightcast.

Source: Lightcast.

Exhibit 21 displays the top ten cities with employers posting job ads for specialty crop processing workers in California over the last 12 months. The cities displayed in the table below account for approximately 40% of all specialty crop processing job ads in California.

Exhibit 21. Cities with the most job ads for specialty crop processing workers, California, Dec 2023–Nov 2024

City (Region)	Job Ad Count
Modesto (North San Joaquin/Coastal)	90
Fresno (South San Joaquin Valley)	71
Lodi (North San Joaquin/Coastal)	68
Napa (North State/Bay Area)	64
Saint Helena (North State/Bay Area)	63
Firebaugh (South San Joaquin Valley)	60
Healdsburg (North State/Bay Area)	51
Visalia (South San Joaquin Valley)	47
Acampo (North San Joaquin/Coastal)	42
Arvin (South Central/Inland)	42
All Other Cities	*888*
Total	**1,486**

Source: Lightcast.

Specialty Crop Industry-wide Job Advertisements

This section displays the top job titles, specialized skills, minimum education requirements, and advertised salaries for workers in the specialty crop industry as a whole. Over the last 12 months, employers in the specialty crop industry posted 2,422 job ads for specialty crop workers across California. Exhibit 22 displays the job titles most frequently included in specialty crop industry employers posting ads over the last 12 months in California. The job titles displayed in the table below represent approximately 17% of all job titles posted in this industry. According to the COE's Specialty Crops Workforce Survey of specialty crop employers in California, approximately 44% employ forklift and tractor operators, and 37% employ mechanics, maintenance, and repair workers. Please note that job ads provide insight into the types of jobs, skills, certifications, and salaries in specialty crop businesses, but do not communicate the actual scale of employment demand.

Exhibit 22. Most frequently requested specialty crop job titles, California, Dec 2023–Nov 2024

Job Titles	Job Ad Count
Forklift Operators	51
Maintenance Technicians	47
Machine Operators	43
Harvest Cellar Workers	98
Bottling Supervisors	34
Laboratory Technicians	32
General Laborers	30
Harvest Workers	30
Maintenance Mechanics	30
Vineyard Managers	26
All Other Job Titles	*2,001*
Total	**2,422**

Source: Lightcast.

Exhibit 23 displays the ten most frequently requested specialized and common skills found in employer job ads posted over the last 12 months for specialty crop workers in California. Specialized skills are occupation-specific skills that employers request for industry or job competency. Common skills are foundational skills that transcend industries and occupations, often referred to as soft skills. Food safety and sanitation skills were mentioned in 21% of specialty crop job ads, demonstrating the importance of food safety to the specialty crop industry. Furthermore, the COE's Specialty Crops Workforce Survey found that approximately 59% of surveyed employers provide safety and compliance training to workers. Nearly three-quarters of survey respondents indicated that they provide workers with on-the-job training opportunities to develop their workforce. Communication and English language skills, frequently found in specialty crop job ads, were identified as barriers to worker advancement by 29% of respondents in the COE's Specialty Crops Workforce Survey.

Exhibit 23. Most requested specialized and common skills for specialty crop workers, California, Dec 2023–Nov 2024

Specialized Skills	Job Ad Count	Common Skills	Job Ad Count
Food Safety and Sanitation	499	Communication	854
Forklift Truck	468	Operations	604
Machinery	390	Lifting Ability	589
Good Manufacturing Practices	375	Management	589
Warehousing	304	Detail Oriented	551
Bilingual (Spanish/English)	288	English Language	449
Winemaking	212	Sanitation	411
Hazard Analysis and Critical Control Points (HACCP)	205	Computer Literacy	351
Production Equipment	156	Troubleshooting (Problem-Solving)	332
Auditing	155	Packaging And Labeling	310

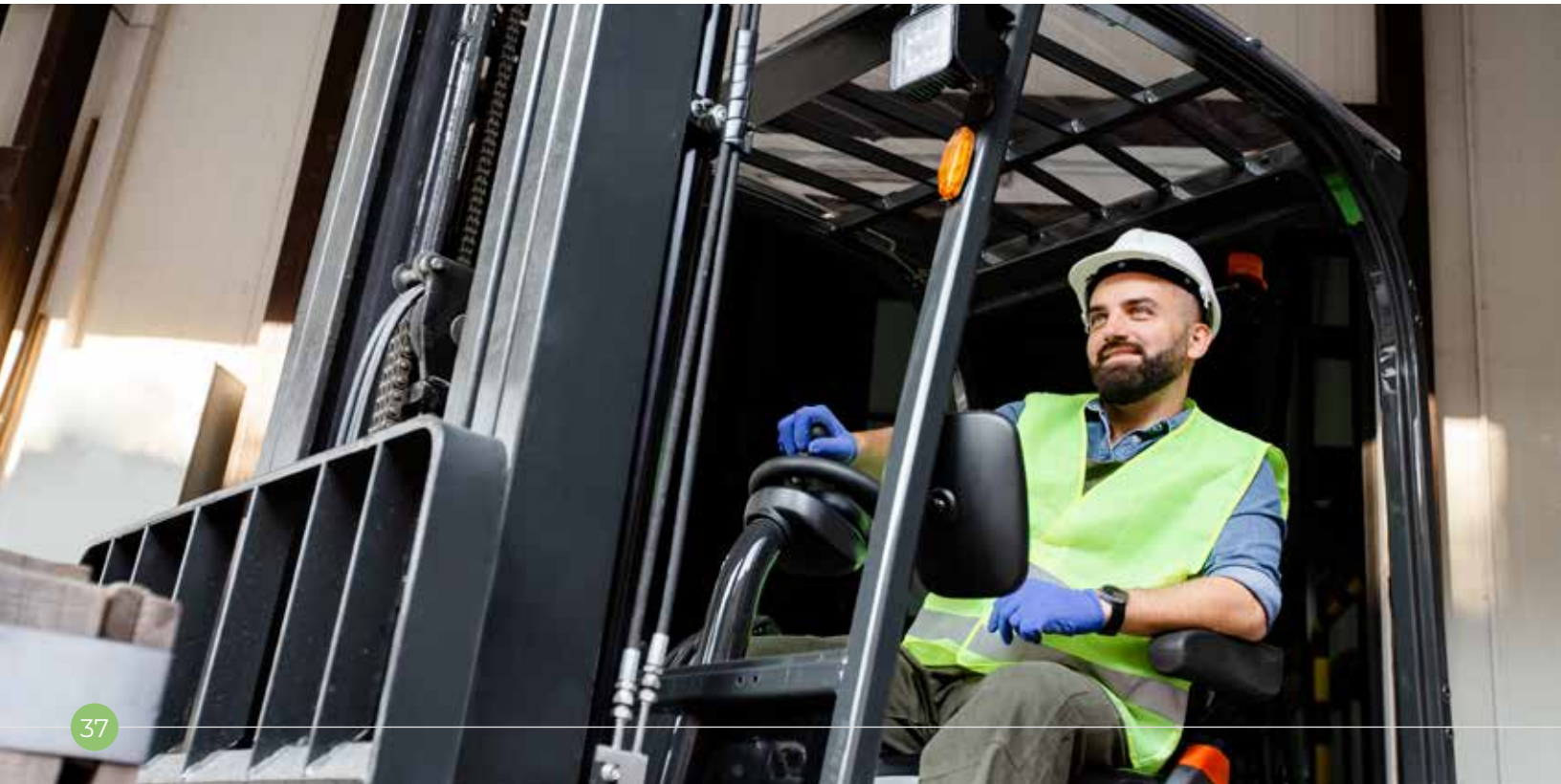
Source: Lightcast.

Over the last 12 months, approximately 38% of employers posted job ads with minimum education requirements. Of the job ads posted with minimum education requirements, approximately 94% sought candidates with a high school diploma or equivalent, and 6% sought an associate degree. Exhibit 24 displays the certifications most frequently included in job advertisements for specialty crop workers. A valid driver's license was the most frequently requested certification, appearing in 17% of employer job ads.

Exhibit 24. Most frequently requested specialty crop certifications, California, Dec 2023–Nov 2024

Certifications	Job Ad Count
Valid Driver's License	412
Forklift Certification	135
CDL Class A License	36
Food Handler's Card	22
Cardiopulmonary Resuscitation (CPR) Certification	20
First Aid Certification	16
Hazard Analysis and Critical Control Point (HACCP) Certification	13
SQF (Safe Quality Food) Practitioner	10
Automated External Defibrillator (AED) Certification	9
Pesticide Applicator License	5

Source: Lightcast.



OCCUPATIONAL EMPLOYMENT

The majority of specialty crop workers are employed in technical roles that do not require a postsecondary degree, making these occupations well-suited to targeted, applied training programs. Farmworkers, equipment operators, and quality control technicians remain foundational roles with high annual job openings. Notably, 60% of projected job openings are for farmworkers and laborers, indicating continued reliance on manual labor. Meanwhile, emerging demand in machinery repair, food safety, and plant science requires greater access to upskilling opportunities, which are currently limited in key regions. Industry survey findings highlight significant barriers to advancement, including lack of English proficiency, limited access to transportation, and a shortage of flexible training options.

An occupation is a collection of jobs and job titles that perform similar work tasks and share similar work knowledge, skills, and abilities. Employees who perform essentially the same tasks are classified in the same occupation, whether or not they are in the same industry. It's important to note that some occupations are concentrated in a few industries (e.g., police officers are only employed in government), whereas other occupations are found in the majority of industries (e.g., information technology workers and maintenance workers).[30]

This report utilizes staffing patterns to identify the occupations that comprise specialty crop employment. Staffing patterns show the occupational makeup of an industry in percentages.[31] The occupations included in this report have at least ten percent of the total occupational jobs employed in the specialty crop industry. The occupations included in this report are employed within the specialty crop industry and represent opportunities for educational pathway development at community colleges and other postsecondary education institutions. As a result, this analysis does not include occupations that typically require workers to possess a bachelor's degree before employment.

The occupations detailed in this analysis accounted for nearly 73% of all specialty crop industry jobs in 2023. Staffing patterns allow the occupations to be grouped by the specialty crop industry group that contains the most occupational employment. The specialty crop support occupational group is the largest at 47%, followed by the crop production and crop processing occupational groups with approximately 21% and 4% of industry jobs, respectively. Occupational group employment shares align with the industry group employment shares, with support being the largest and processing being the smallest.

Exhibit 25 displays the occupations in the specialty crop production occupational group, specialty crop industry employment, all employment, and the share of occupational jobs employed in the specialty crop industry. The specialty crop production occupational group is highly employed in the specialty crop industry, with approximately 91% of occupational group jobs employed in this industry in 2023. These traditional agricultural occupations are primarily employed in the specialty crop industry group.

Exhibit 25. Specialty crop production occupations, California, 2023

Specialty Crop Production Occupations	Specialty Crop Industry Employment (2023 Jobs)	All Industry Employment (2023 Jobs)	Share of Jobs Employed in Specialty Crops Industry
Farmers, Ranchers, and Other Agricultural Managers	57,920	58,924	98%
Farmworkers, Farm, Ranch, and Aquacultural Animals	20,087	21,845	92%
Agricultural Equipment Operators	15,232	16,475	92%
Agricultural Workers, All Other	12,997	14,276	91%
Agricultural Technicians	1,065	3,322	32%
Forest and Conservation Workers	343	3,589	10%
Total	**107,643**	**118,432**	**91%**

Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Exhibit 26 displays the occupations in the specialty crop support occupational group, specialty crop industry employment, all employment, and the share of occupational jobs employed in the specialty crop industry. The occupations in the specialty crop support occupational group had two-thirds of jobs employed in the specialty crop industry, demonstrating strong occupational alignment with the specialty crop industry. However, this is largely due to the scale of farmworker employment and its alignment to the specialty crop industry. Other occupations in this occupational group, such as packers and packagers, are employed by many industries, with only 13% of occupational jobs in this industry. While this occupation's employment is distributed across many industries, it is the sixth-largest specialty crop occupation in terms of employment.

Exhibit 26. Specialty crop support occupations, California, 2023

Specialty Crop Support Occupations	Specialty Crop Industry Employment (2023 Jobs)	All Industry Employment (2023 Jobs)	Share of Jobs Employed in Specialty Crops Industry
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	203,976	225,260	91%
Packers and Packagers, Hand	12,447	93,072	13%
First-Line Supervisors of Farming, Fishing, and Forestry Workers	10,770	13,739	78%
Graders and Sorters, Agricultural Products	7,132	8,370	85%
Farm Equipment Mechanics and Service Technicians	1,549	4,154	37%
Pesticide Handlers, Sprayers, and Applicators, Vegetation	967	2,486	39%
Cutting and Slicing Machine Setters, Operators, and Tenders	510	3,722	14%
Farm Labor Contractors	236	250	94%
Total	**237,585**	**351,053**	**68%**

Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Exhibit 27 displays the occupations in the specialty crop processing occupational group, specialty crop industry employment, all employment, and the share of occupational jobs employed in the specialty crop industry. The occupations in the specialty crop processing occupational group had 25% of jobs employed in the specialty crop industry. The occupations in the specialty crop processing occupational group are commonly associated with manufacturing industries, with approximately 75% of occupational employment in industries outside of specialty crops. However, these occupations are essential to processing specialty crops into products for final consumption.

Exhibit 27. Specialty crop processing occupations, California, 2023

Specialty Crop Processing Occupations	Specialty Crop Industry Employment (2023 Jobs)	All Industry Employment (2023 Jobs)	Share of Jobs Employed in Specialty Crops Industry
Packaging and Filling Machine Operators and Tenders	9,935	42,777	23%
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	4,145	10,474	40%
Food Batchmakers	2,861	13,301	22%
Food Processing Workers, All Other	1,479	8,075	18%
Food Science Technicians	1,179	4,271	28%
Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	923	3,226	29%
Food Cooking Machine Operators and Tenders	900	3,309	27%
Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	444	1,483	30%
Cooling and Freezing Equipment Operators and Tenders	150	692	22%
Total	**22,017**	**87,607**	**25%**

Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Exhibit 28 displays occupational employment in the specialty crop industry by specialty crop occupational group. All data displayed is specific to the specialty crop industry. The projected job openings in the specialty crop industry were calculated by multiplying the occupation's share of jobs in the specialty crop industry by the number of annual job openings projected across all industries between 2023 and 2028. The median hourly earnings are provided for each occupation in the specialty crop occupational group. Median hourly earnings represent the 50th percentile earnings for an occupation, indicating half of workers earn less and half of workers earn more than that amount. On average, the median hourly earnings for specialty crop workers in California are $1.30 higher per hour, or $2,700 higher per year, than specialty crop workers throughout the country.

Specialty crop occupations are projected to have more than 54,500 annual job openings in the specialty crop industry over the next five years. Nearly 60% of all projected job openings are for the occupation, farmworkers and laborers, crop, nursery, and greenhouse, demonstrating the continued importance for manual laborers in the industry. See Appendix D for education and experience requirements by occupation.

Exhibit 28. Specialty crop processing occupations, California, 2023

Occupation	2023 Jobs	2023 - 2028 Change	2023 - 2028 % Change	Projected Annual Job Openings
Farmers, Ranchers, and Other Agricultural Managers	57,920	(74)	(0%)	6,364
Farmworkers, Farm, Ranch, and Aquacultural Animals	20,087	(422)	(2%)	3,050
Agricultural Equipment Operators	15,232	1,182	8%	2,559
Agricultural Workers, All Other	12,997	294	2%	2,042
Agricultural Technicians	1,065	36	3%	159
Forest and Conservation Workers	343	(8)	(2%)	66
Specialty Crop Production Subtotal	**107,643**	**1,008**	**(2%)**	**68%**
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	203,976	8,342	4%	32,356
Packers and Packagers, Hand	12,447	1,006	8%	1,889
First-Line Supervisors of Farming, Fishing, and Forestry Workers	10,770	750	7%	1,600
Graders and Sorters, Agricultural Products	7,132	59	1%	1,075
Farm Equipment Mechanics and Service Technicians	1,549	156	10%	152
Pesticide Handlers, Sprayers, and Applicators, Vegetation	967	115	12%	146
Cutting and Slicing Machine Setters, Operators, and Tenders	510	24	5%	59
Farm Labor Contractors	236	18	7%	23
Specialty Crop Support Subtotal	**237,585**	**10,470**	**4%**	**54,393**
Packaging and Filling Machine Operators and Tenders	9,935	220	2%	1,197
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	4,145	258	6%	447
Food Batchmakers	2,861	333	12%	513
Food Processing Workers, All Other	1,479	94	6%	172
Food Science Technicians	1,179	52	4%	172
Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	923	52	6%	108

Occupation	2023 Jobs	2023 - 2028 Change	2023 - 2028 % Change	Projected Annual Job Openings
Food Cooking Machine Operators and Tenders	900	47	5%	144
Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	444	51	11%	74
Cooling and Freezing Equipment Operators and Tenders	150	3	2%	19
Specialty Crop Processing Subtotal	**22,017**	**1,110**	**5%**	**2,847**
Specialty Crop Total	**367,246**	**12,587**	**3%**	**81,857**

Source: Lightcast 2024.3, QCEW Employees, Non-QCEW Employees, and Self-Employed.

Occupational Insights from Job Advertisements

This section of the report analyzes advertisements (ads) to gauge employer demand for specialty crop workers in California. Specialty crop job ads were obtained by conducting a search for ads posted by employers in the specialty crop industry. Specialty crop job ads were obtained by conducting a job posting search for the specialty crop occupations listed in the previous section within the specialty crop industry. Job ad information displayed in this section is separated by industry group to illuminate the job titles, certifications, education requirements, specialized and common skills, and wages unique to each specialty crop industry group. Over the last 12 months, there were 289 job ads posted for specialty crop occupations, listed in the previous section, in the specialty crop industry. Forty-six percent of job ads were posted for specialty crop production workers, 28% for support workers, and 26% for processing workers.

Production Occupation Job Ads

Over the last 12 months, between December 2023 and November 2024, there were 133 job ads posted for specialty crop production occupations in the specialty crop industry. More than one-third of job ads were posted in the Napa, Bakersfield, and Santa Rosa-Petaluma metropolitan statistical areas (MSA). Exhibit 29 displays the number of job ads posted for specialty crop production occupations. More than half of specialty crop production job ads were for farmers, ranchers, and other agricultural managers.

Exhibit 29. Ads for specialty crop production occupations, California, Dec 2023–Nov 2024

Occupation	Job Ad Count
Farmers, Ranchers, and Other Agricultural Managers	68
Agricultural Technicians	32
Farmworkers, Farm, Ranch, and Aquacultural Animals	31
Agricultural Equipment Operators	2
Agricultural Workers, All Other	0
Forest and Conservation Workers	0
Specialty Crop Production Industry Group Total	**133**

Source: Lightcast.

Exhibit 30 displays the top job titles for specialty crop production occupations from job ads posted over the last 12 months in California. The job titles displayed in the table below represent approximately 48% of all job titles posted for this occupational group.

Exhibit 30. Most frequently requested specialty crop production job titles, California, Dec 2023–Nov 2024

Job Titles	Job Ad Count
Vineyard Managers	19
Irrigators	14
Harvest Interns	8
Beekeepers	5
Lead Equipment Operators	4
Harvesters	4
Agricultural Service Technicians	4
Harvest Cellar Interns	3
Orchard Managers	2
Farm Equipment Operators	2

Source: Lightcast.

Exhibit 31 displays the ten most frequently requested specialized and common skills found in employer job ads posted over the last 12 months for specialty crop production workers in California. Specialized skills are occupation-specific skills that employers request for industry or job competency. Common skills are foundational skills that transcend industries and occupations, often referred to as soft skills. Irrigation skills were mentioned in 40% of crop production job ads, indicating that this skill may be essential for crop production workers. The COE's Specialty Crops Workforce Survey confirmed the necessity for irrigation skills, with nearly 78% of survey respondents indicating they employ irrigation specialists.

Exhibit 31. Most requested specialized and common skills for specialty crop production workers, California, Dec 2023–Nov 2024

Specialized Skills	Job Ad Count	Common Skills	Job Ad Count
Irrigation	54	Communication	50
Forklift Truck	33	Management	44
Weed Control	28	Operations	42
Winemaking	24	Lifting Ability	41
Bilingual (Spanish/English)	20	Detail Oriented	35
Pruning	20	English Language	24
Equipment Maintenance	19	Self-Motivation	23
Equipment Inspection	18	Strong Work Ethic	22
Erosion Control	16	Research	22
Food Safety and Sanitation	16	Multilingualism	21

Source: Lightcast.

Over the last 12 months, 33 job advertisements for specialty crop production workers included minimum education requirements. Thirty-two of the 33 specialty crop production job ads sought candidates with a high school diploma or equivalent, while one employer sought a candidate with an associate degree. Over the last 12 months, 51 job ads sought candidates with a valid driver's license, and four ads sought candidates with a forklift certification.

Support Occupation Job Ads

Over the last 12 months, between December 2023 and November 2024, there were 80 job ads posted for specialty crop support occupations in the specialty crop industry. Approximately 40% of job ads were posted in the San Diego-Chula Vista-Carlsbad, Fresno, and Sacramento-Roseville-Folsom MSAs. Exhibit 32 displays the number of job ads posted for specialty crop support occupations. More than half the of specialty crop support job ads were for farmworkers and laborers, crop, nursery, and greenhouse.

Exhibit 32. Ads for specialty crop support occupations, California, Dec 2023–Nov 2024

Occupation	Job Ad Count
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	41
Packers and Packagers, Hand	33
Pesticide Handlers, Sprayers, and Applicators, Vegetation	4
Farm Equipment Mechanics and Service Technicians	2
First-Line Supervisors of Farming, Fishing, and Forestry Workers	0
Graders and Sorters, Agricultural Products	0
Cutting and Slicing Machine Setters, Operators, and Tenders	0
Farm Labor Contractors	0
Specialty Crop Support Industry Group Total	**80**

Source: Lightcast.

Exhibit 33 displays the top job titles for specialty crop support occupations from job ads posted over the last 12 months in California. The job titles displayed in the table below represent two-thirds of all job titles posted for this occupational group.

Exhibit 33. Most frequently requested specialty crop support job titles, California, Dec 2023–Nov 2024

Job Titles	Job Ad Count
Packers/Packagers	18
Farm Laborers/Workers	11
Pickers	6
Greenhouse Associates/Technicians	5
Growers	4
Pesticide Applicators/Spray Technicians	3
Fruit Experts	3
Vineyard Managers	3

Source: Lightcast.

Exhibit 34 displays the ten most frequently requested specialized and common skills found in employer job ads posted over the last 12 months for specialty crop support workers in California. Specialized skills are occupation-specific skills that employers request for industry or job competency. Common skills are foundational skills that transcend industries and occupations, often referred to as soft skills. Irrigation skills were mentioned in 20% of crop support job ads, indicating this skill is desired for crop support workers.

Exhibit 34. Most requested specialized and common skills for specialty crop support workers, California, Dec 2023–Nov 2024

Specialized Skills	Job Ad Count	Common Skills	Job Ad Count
Irrigation	18	Communication	21
Forklift Truck	14	Packaging And Labeling	19
Machinery	14	Operations	18
Bilingual (Spanish/English)	13	Lifting Ability	17
Food Safety and Sanitation	12	Multilingualism	16
Hand Tools	8	Management	16
Palletizing	8	Punctuality	13
Transplanting	8	Detail Oriented	12
Weed Control	8	English Language	11
Fertilizers	6	Coordinating	10

Source: Lightcast.

Over the last 12 months, 21 job advertisements for specialty cop support workers included minimum education requirements. Nineteen of the 21 specialty crop support job ads sought candidates with a high school diploma or equivalent, while two ads sought a candidate with an associate degree. Over the last 12 months, seven job ads sought candidates with a valid driver's license, and three ads sought candidates with a forklift certification.

Processing Occupation Job Ads

Over the last 12 months, between December 2023 and November 2024, there were 76 job ads posted for specialty crop processing occupations in the specialty crop industry. More than half of job ads were posted in the Visalia, Fresno, and Bakersfield MSAs. Exhibit 35 displays the number of job ads posted for specialty crop processing occupations. Approximately 58% of specialty crop processing job ads were for packaging and filling machine operators and tenders.

Exhibit 35. Ads for specialty crop processing occupations, California, Dec 2023–Nov 2024

Occupation	Job Ad Count
Packaging and Filling Machine Operators and Tenders	44
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	22
Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	4
Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	3
Food Science Technicians	2
Food Processing Workers, All Other	1
Cooling and Freezing Equipment Operators and Tenders	0
Food Batchmakers	0
Food Cooking Machine Operators and Tenders	0
Specialty Crop Processing Industry Group Total	**76**

Source: Lightcast.

Exhibit 36 displays the top job titles for specialty crop processing occupations from job ads posted over the last 12 months in California. The job titles displayed in the table below represent approximately 68% of all job titles posted for this occupational group.

Exhibit 36. Most frequently requested specialty crop processing job titles, California, Dec 2023–Nov 2024

Job Titles	Job Ad Count
Winemakers	17
Packaging Operators/Technicians	16
Palletizer Operators	6
Filler Operators	4
Blender Operators	3
Equipment Operators	3
Production Technicians	3

Source: Lightcast.

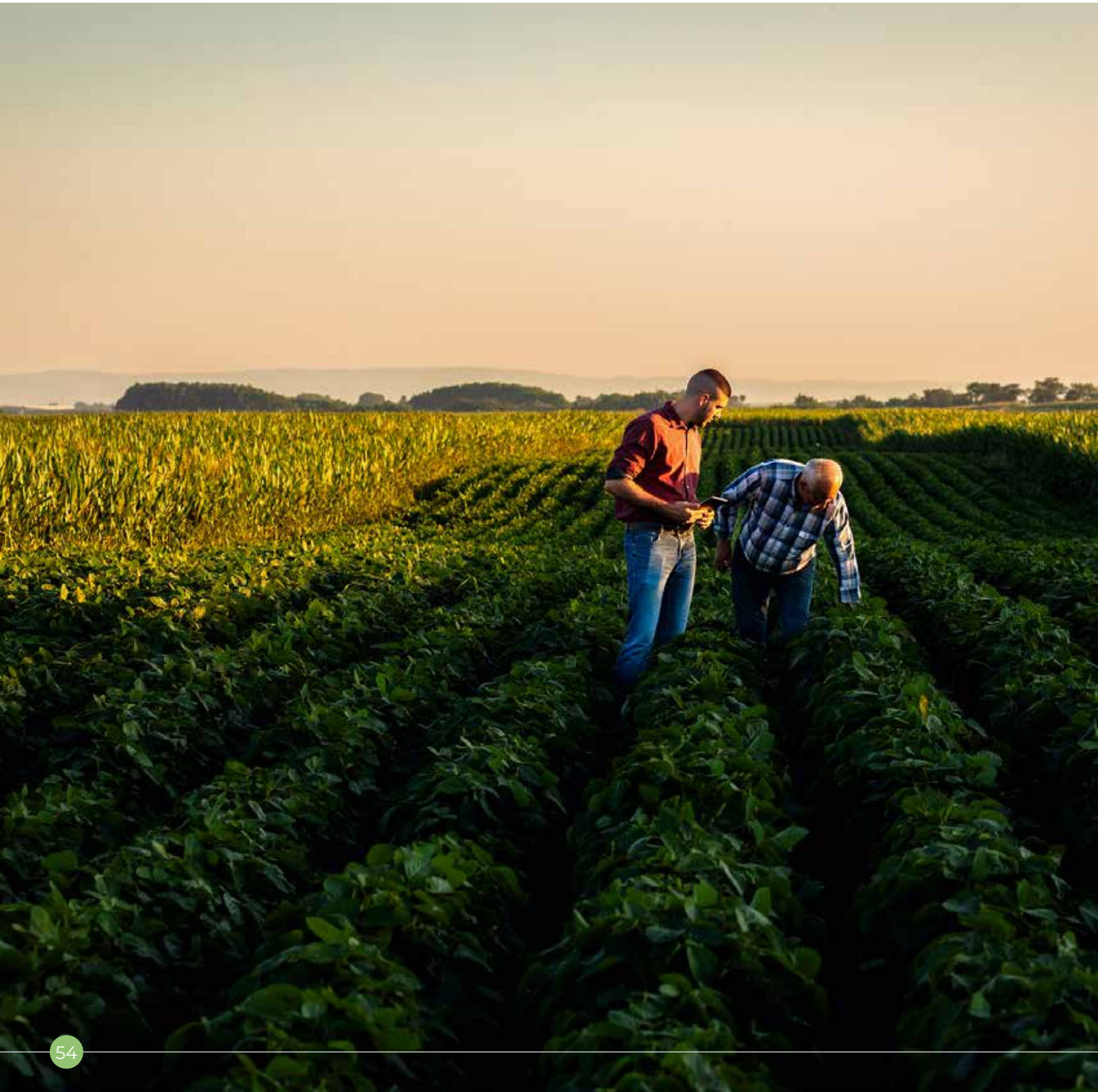
Exhibit 37 displays the ten most frequently requested specialized and common skills found in employer job ads posted over the last 12 months for specialty crop processing workers in California. Specialized skills are occupation-specific skills that employers request for industry or job competency. Common skills are foundational skills that transcend industries and occupations, often referred to as soft skills. Food safety and sanitation skills were mentioned in 34% of crop processing job ads, indicating this skill is desired for crop processing workers.

Exhibit 37. Most requested specialized and common skills for specialty crop processing workers, California, Dec 2023–Nov 2024

Specialized Skills	Job Ad Count	Common Skills	Job Ad Count
Food Safety and Sanitation	26	Lifting Ability	26
Hazard Analysis and Critical Control Points (HACCP)	19	Computer Literacy	26
Forklift Truck	13	Packaging And Labeling	26
Regulatory Documents	10	Troubleshooting (Problem-Solving)	26
Good Manufacturing Practices	10	Communication	21
Machinery	10	English Language	20
Auditing	9	Operations	20
Winemaking	8	Detail Oriented	19
Fermentation	8	Sanitation	16
Palletizing	8	Punctuality	13

Source: Lightcast.

Over the last 12 months, 35 job advertisements for specialty cop processing workers included minimum education requirements. All job ads with education requirements sought candidates with a high school diploma or equivalent. Over the last 12 months, eighteen job ads sought candidates with a forklift certification, and two ads sought candidates with a valid driver's license.



EDUCATIONAL PATHWAY ANALYSIS

The educational pathway analysis reveals that while community colleges and adult education programs provide a range of training options for specialty crop careers, the scale, scope, and structure of these offerings vary significantly across regions. In many cases, program availability does not align with the size or specific needs of the regional workforce. Courses and credentials in agricultural mechanics, food safety, and equipment operation are limited or absent in several high-employment regions. Additionally, many existing programs do not incorporate industry-recognized certifications or short-term, stackable credentials that reflect employer preferences. Although training capacity is stronger in some northern and coastal regions relative to their workforce size, occupational alignment and flexible delivery models—such as evening classes or bilingual instruction—remain underdeveloped statewide.

Programs related to the specialty crop workforce training are available to students at K-12 institutions, enrolled in adult education programs, community colleges, and four-year institutions. The average level of formal education completed by California farmworkers was eighth grade between 2015 and 2019, indicating that workers may be interested in training opportunities that will improve their employment prospects.[32] Additionally, 25% of California farmworkers have taken at least one adult education class.[33] Community colleges and adult education programs are most likely to provide the training needed to upskill farmworkers, offering career and technical education programs and English as a Second Language programs, respectively. Approximately 35% of farmworkers cannot speak English and 47% cannot read English, indicating that English language programs may provide the training needed for career advancement.[34]

K-12 and Adult Education Programs

California's K-12 public schools and Adult Education programs align their courses with the state's Career Technical Education (CTE) framework, which prepares students for entry-level careers through practical skills training, industry certifications, and hands-on learning. The framework consists of 15 industry sectors and 59 career pathways, including the Agriculture and Natural Resources sector. The Agriculture and Natural Resources sector is designed to provide a foundation in agriculture for all agriculture students in California through instructional

programs that integrate academic and technical preparation focusing on career awareness, career exploration, and skill preparation in seven pathways. The pathways emphasize real-world, occupationally relevant experiences of significant scope and depth in Agricultural Business, Agricultural Mechanics, Agriscience (including sustainable agriculture), Animal Science, Forestry and Natural Resources, Ornamental Horticulture (including floral design), and Plant and Soil Science.[35]

Agricultural education programs in the K-12 space integrate academic and technical training, providing students with career awareness, exploration, and skill development through real-world, occupationally relevant experiences. Classroom instruction, laboratory work, supervised agricultural experience (SAE) projects, and leadership development collectively equip students for further education or direct entry into the workforce, particularly in specialty crop production. However, identifying and quantifying K-12 and Adult Education programs within this sector remains challenging due to the absence of a centralized data repository. To assess current offerings, the COE utilized the annual K-12 Agricultural Education report and conducted an online review of adult education programs.

Agricultural Education in California's K-12 Schools

Agricultural education in California K-12 schools is centered around a three-prong approach: classroom and laboratory instruction, Future Farmers of America (FFA) leadership development, and supervised experiential learning projects.[36] Several major federal and state programs provide funding for these programs, including the Perkins Vocational Act of 1998 and the Agricultural Education Vocational Incentive Program. These programs seek to accomplish four main goals:

- Improve agricultural education programs by integrating and implementing an academic and vocational curriculum aligned with workforce needs, including support services for special populations.
- Strengthening agricultural education instructors' skills in developing and implementing curriculum, certification systems, and effective teaching methods.
- Promote the development and use of instructional materials and strategies that prepare students for all aspects of the agricultural industry sector and foster critical thinking, problem solving, leadership, and skill attainment.
- Increase alignment and connections across agricultural education programs, educators, institutions, employers, professional associations, and local communities.

An annual report is released every year as part of the state's K-12 Agricultural Education program. Key findings from the K-12 2024 Annual Agricultural Education report include:

- **Increased desire to offer more programs across the state, especially at the middle school level** - In 2024, the were 372 school sites offering agricultural education programs while holding an FFA charter. Ninety-three percent (344) of these programs were in secondary (or high) schools alone, while the remaining 7% of programs were found in middle schools (n=23) or mixed grade middle and high schools (1%, or 5 schools).
- **Increased student participation** - In 2024, more than 104,000 California students were engaged in agricultural education programs. More than 95 percent of agriculture education students were enrolled in grades 9-12.
- **Diverse career pathways** - California's agricultural education program provides students with access to seven career pathways that cover 300 agricultural careers. The career pathways with the most student enrollment include agricultural mechanics (35%), plant science (27%), and animal science (25%) (Exhibit 38). Data was not available for the ornamental horticulture career pathway.
- **Incentive Grants** – The Agricultural Education Incentive Grant (AEIG) supported 318 high schools across 232 districts, distributing over $6.1 million during the 2023-24 academic year. Exhibit 43 provides a breakdown of funds distributed by region.

Exhibit 38. K-12 enrollment by Agriculture and Natural Resources career pathway, 2023-24

CTE Career Pathway	Share of Student Enrollment (%)	Estimated Student Enrollment*
Agricultural Mechanics	35%	36,558
Plant and Soil Science	27%	28,202
Animal Science	25%	26,113
Agriculture Business	6%	6,267
Agriscience	4%	4,178
Forestry and Natural Resources	3%	3,134
Ornamental Horticulture	N/A	N/A
California Total	**100%**	**104,450**

Source: California Department of Education (CDE) K-12 2024 Annual Agricultural Education report. *Note: Estimated student enrollment was calculated based on overall enrollment of 104,450 students during the 2023-24 school year.

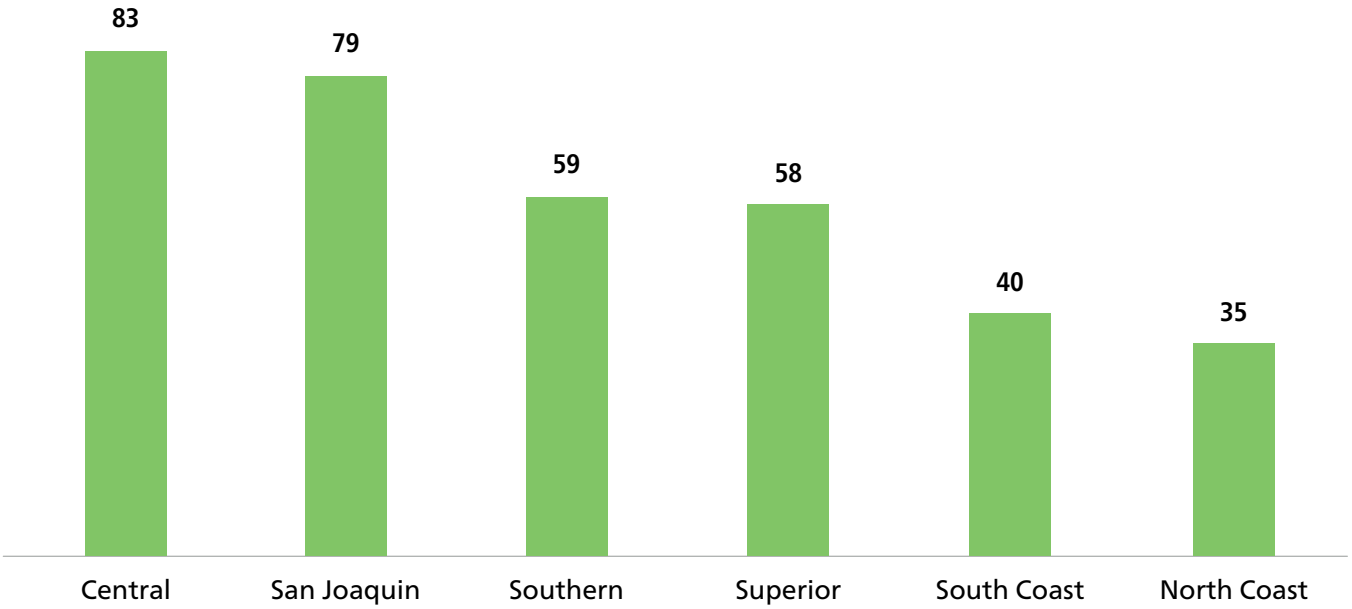
Exhibit 39. Agricultural Education Incentive Grant (AEIG) funds by region, 2023-24

Region	Number of Schools Receiving AEIG Funds	Amount Allocated	Average Allocation per School
Central*	78	$1,645,172	$21,936
San Joaquin	67	$1,297,263	$19,362
Superior	57	$962,836	$16,891
Southern*	53	$892,020	$16,831
South Coast*	36	$701,490	$19,486
North Coast*	32	$635,218	$19,851
California Total	**320**	**$6,133,999**	**$19,169**

Source: California Department of Education (CDE) K-12 2024 Annual Agricultural Education report. *Notes: The Central and North Coast regions include schools located within Sacramento County. The South Coast and Southern regions include schools located within Los Angeles County.

Comprehensive data on the number, types, and completion of agricultural education programs in California's K-12 schools is not readily accessible in a centralized format. However, COE sourced regional program counts from the California Agricultural Education's regions webpage (Exhibit 40). According to this data, California's K-12 schools offer over 350 agricultural education programs.

Exhibit 40. Count of California's K-12 Agricultural Educational programs by region



Source: California Agricultural Education, https://www.calaged.org/regions.

Agricultural Training in California's Adult Education Programs

Agriculture plays a vital role in California's economy, workforce, and communities, making agricultural education a key component of the state's Adult Education Program system. Designed to equip adult learners with the knowledge, skills, and certifications needed for careers in agriculture, these programs provide hands-on training, industry-aligned curricula, and career pathways in high-demand agricultural sectors. By integrating technical education with workforce development, California's Adult Education agricultural programs support lifelong learning, economic mobility, and the sustainability of the state's diverse agricultural industry.

This section of the report explores the structure, opportunities, and impact of agricultural education within the Adult Education Program system, highlighting its role in preparing individuals for meaningful employment and career advancement.

California's adult education network is comprised of 71 regional consortia across the state, which includes members from County Offices of Education, Regional Occupational Programs, school districts, community colleges, and joint powers authorities consisting of a combination of members.

Program areas offered through California's Adult Education provider network include[37]:

- Adult Basic Education (ABE) and Adult Secondary Education (ASE) - focused on literacy, numeracy, and high school diploma or GED equivalencies,
- English as a Second Language (ESL) – language proficiency for non-native speakers,
- Citizenship and civics education – preparation for U.S. citizenship and civic engagement,
- Short-term Career Technical Education (CTE) – for vocational training in in-demand fields like healthcare, IT, and business,
- Workforce readiness and reentry programs – job skills training and support for formerly incarcerated individuals,
- Programs for Adults with Disabilities (AWD) – accessible education and career training,
- And training for adults to support K-12 child success.

To understand and quantify the types of agricultural programs offered through the California Adult Program, the COE conducted an inventory of adult education regional consortium member webpage pages. The inventory is based on a scan of publicly available course catalogs, which are required by law (California Ed Code section 52523) to provide the most up-to-date course information for students and focused primarily on in-person or online courses offered through members of the consortium. Online programs offered through third-party vendors, such as Ed2Go or Edgenuity, were excluded from analysis. Also, programs offered through Community College members were excluded from analysis to minimize the overlap with the community college analysis section of this report.

According to an inventory of Adult Education member webpages, approximately 2% of the currently offered short-term career technical education programs are aligned to the Agriculture and Natural Resources industry sector (Exhibit 41) – this equates to 21 in-person or online programs offered directly through adult education members across the state.

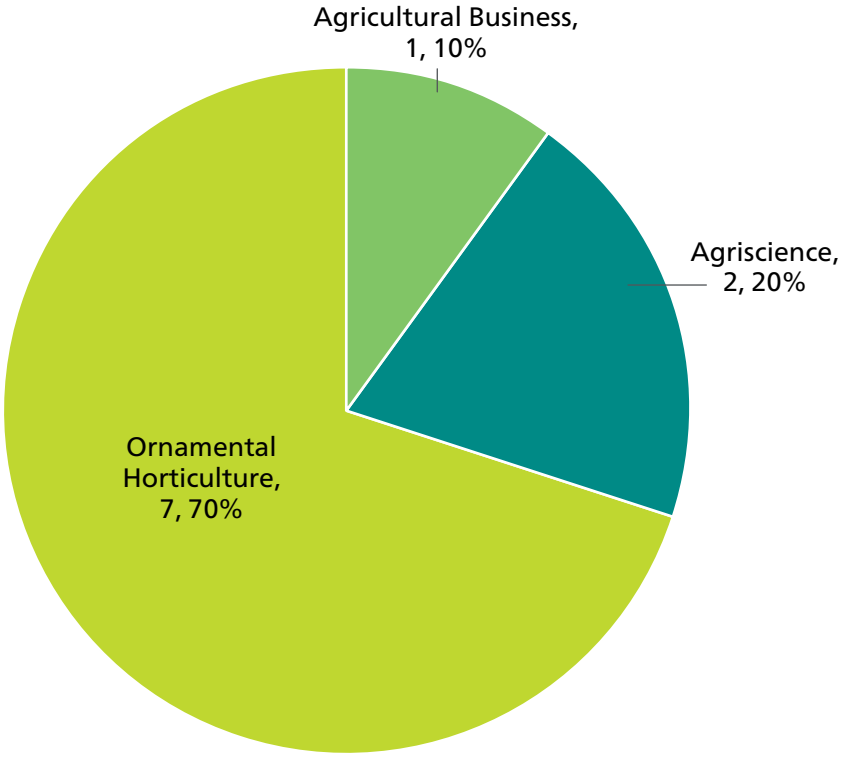
Exhibit 41. Adult Education courses by CTE industry sector

CTE Industry Sector	Number of Programs	Share of Programs
Agriculture and Natural Resources	21	2%
Arts, Media, and Entertainment	37	3%
Building and Construction Trades	122	9%
Business and Finance	225	16%
Education, Child Development, and Family Services	73	5%
Energy, Environment, and Utilities	14	1%
Engineering and Architecture	12	1%
Fashion and Interior Design	44	3%
Health Science and Medical Technology	452	32%
Hospitality, Tourism, and Recreation	50	4%
Information and Communication Technologies	88	6%
Manufacturing and Product Development	73	5%
Marketing Sales and Service	40	3%
Public Services	76	5%
Transportation	72	5%
California Total	**1,399**	**100%**

Source: COE analysis of California Adult Education Programs.

Exhibit 42 presents the distribution of Adult Education Agricultural and Natural Resource programs by career pathway. Of the ten programs identifies, more than half of the available courses fall under the Ornamental Horticulture career pathway (7), followed by Agriscience (2), and Agricultural Business (1). These pathways are typically designed to prepare learners for careers in agricultural business operations and management, as well as nursery, landscaping, and floral industries. Although animal science programs are part of the Agricultural and Natural Resources sector, they were excluded from this list due to their misalignment with the occupational focus of this report.

Exhibit 42. Share of CAEP agricultural courses by career pathway



Source: COE analysis of California Adult Education Programs.

Exhibit 43 provides a list of Agricultural and Natural Resources courses offered across the state by CDFA region and California Adult Education Program consortium.

Exhibit 43. List of agricultural courses by CDFA region and CAEP Consortium

CDFA Region	CAEP Consortium	CTE Program
North San Joaquin/Coastal	Contra Costa Adult Education Consortium	Floral Design
	Foothill De Anza/North Santa Clara County Consortium (NSCCC)	Green Gardener Certificate
North State/Bay Area	Napa Valley Adult Education Consortium	Small Scale Farming
	Solano Adult Education Consortium	Land and Caretakers
	Solano Adult Education Consortium	Permaculture Design Certificate
	Sonoma County Adult Education Consortium	Fire Resilient Landscaping
	Sonoma County Adult Education Consortium	Introduction to Landscaping
South Central/Inland	Los Angeles Regional Adult Education Consortium	Landscaping
	Salinas Valley Adult Education Consortium	Ag Science
	Tri City Adult Education Consortium	Pest Control

Source: COE analysis of California Adult Education Programs.

Community College Programs

The California Community College Chancellor's Office Taxonomy of Programs (TOP) Manual contains a system of numerical codes used to aggregate information about courses and programs throughout California. Program codes are disciplines that group similar programs. The Agriculture and Natural Resources discipline includes "Instructional programs that prepare individuals to apply scientific knowledge and methods, and technical skills, to support agribusiness and agricultural activities, such as management, production and propagation, supplies and services, mechanics, marketing, and horticulture.[38]" While 22 programs exist within the agriculture and natural resources discipline, only 14 programs provide education most likely to prepare students for employment in the specialty crop sector. The following are specialty crop programs offered at community colleges in the state:

- 010100 - Agriculture Technology and Sciences, General
- 010300 - Plant Science
- 010310 - Agricultural Pest Control Adviser and Operator (Licensed)
- 010400 - Viticulture, Enology, and Wine Business
- 010900 - Horticulture
- 010920 - Floriculture /Floristry
- 010930 - Nursery Technology
- 010940 - Turfgrass Technology
- 011200 - Agriculture Business, Sales and Service
- 011300 - Food Processing and Related Technologies
- 011400 - Forestry
- 011500 - Natural Resources
- 011600 - Agricultural Power Equipment Technology
- 019900 - Other Agriculture and Natural Resources

Community colleges in California are projected to issue 1,881 awards annually in programs related to specialty crops. Over half of the community college awards in specialty crop programs come from three programs: Agriculture Power Equipment Technology (0116.00), Agriculture Business, Sales and Services (0112.00), and Plant Science (0103.00), indicating these programs are popular training programs. Exhibit 44 displays community college awards for specialty crop programs in California as well as the number of colleges offering programs.

Exhibit 44. California Community College specialty crop awards by program, 2020–2023

Program Title – TOP Code	Count of Colleges	Projected Annual Program Supply
Agricultural Pest Control Adviser and Operator (Licensed)-0103.10	7	11
Agricultural Power Equipment Technology-0116.00	10	352
Agriculture Business, Sales and Service-0112.00	20	320
Agriculture Technology and Sciences, General-0101.00	21	199
Floriculture/Floristry-0109.20	11	40
Food Processing and Related Technologies-0113.00	5	29
Forestry-0114.00	9	136
Horticulture-0109.00	37	243
Natural Resources-0115.00	16	144
Nursery Technology-0109.30	13	30
Other Agriculture and Natural Resources-0199.00	2	7
Plant Science-0103.00	26	288
Turfgrass Technology-0109.40	4	17
Viticulture, Enology, and Wine Business-0104.00	9	67
Total	**62**	**1,881**

Source: California Community Colleges Chancellor's Management Information Systems DataMart.

Exhibit 45 displays community college specialty crop awards by region. Despite having the fewest community colleges offering specialty crop education, the South San Joaquin Valley Region has issued the most awards over the last three academic years. In this region, the most awards were issued in the Agricultural Power Equipment Technology (0116.00) program, with 261 awards issued annually. Nearly a quarter of the State's community college supply comes from the South Central/Inland Region, comprising Kern, Los Angeles, Monterey, San Bernardino, San Luis Obispo, and Santa Barbara counties. The South Central/Inland Region contains the most colleges offering specialty crop education.

The North State/Bay Area Region has 16 community colleges offering specialty crop education, issuing 365 awards annually or 19.4% of statewide specialty crop awards. The North San Joaquin/Coastal Region contains 11 community colleges that have issued over 200 awards annually in specialty crop programs. The Southern Region,

containing Imperial, Orange, Riverside, and San Diego counties, issued only 8.2% of statewide awards over the last three academic years. In the Southern Region, the majority of program awards came from regional horticulture (0109.00) programs. College of the Desert and Saddleback College issued the majority of awards in the Southern Region.

Exhibit 45. California Community College specialty crop awards by region, 2020–2023

CDFA Specialty Crop Workforce Development Region	Count of Colleges	3-Year Average Awards	Share of Awards
North San Joaquin/Coastal	11	202	10.7%
North State/Bay Area	16	365	19.4%
South Central/Inland	17	460	24.5%
South San Joaquin Valley	7	700	37.2%
Southern Region	11	154	8.2%
California Total	**62**	**1,881**	**100%**

Source: California Community Colleges Chancellor's Management Information Systems DataMart.

Exhibit 46 displays the number of specialty crop programs offered by community colleges in California, as well as the location of the college and the number of awards issued by institutions over the last three academic years. Across the state, community colleges provide students with educational opportunities in each of the 14 program codes that prepare students for employment in specialty crops occupations. Reedley College, located in the South San Joaquin Valley Region, is the most dominant college issuing specialty crop awards in the state. Over the last three academic years, Reedley College has issued approximately 23% of statewide specialty crop awards, with 435 awards issued annually. Bakersfield College, located in Kern County, has issued the second most awards in the state over the last three years, with an average of 128 awards annually. The top seven colleges issuing awards account for more than half of California's specialty crop supply from community colleges.

Exhibit 46. California Community College specialty crop awards by region and college, 2020–2023

Region/Community College	City	Count of Programs	3-Year Average Awards
North San Joaquin/Coastal Region		**11**	**202**
Cabrillo College	Aptos	4	23
Columbia College	Sonora	2	29
De Anza College	Cupertino	1	0
Diablo Valley College	Pleasant Hill	3	10
Foothill College	Los Altos Hills	1	10
Las Positas College	Livermore	2	5
Merritt College	Oakland	4	11
Modesto Junior College	Modesto	8	86
City College of San Francisco	San Francisco	2	7
San Joaquin Delta College	Stockton	5	12
West Valley College	Saratoga	1	9
North State/Bay Area Region	**12**	**365**	
American River College	Sacramento	3	41
Butte College	Oroville	9	60
Cosumnes River College	Sacramento	3	9
Feather River College	Quincy	2	41
Folsom Lake College	Folsom	1	3

Region/Community College	City	Count of Programs	3-Year Average Awards
Lake Tahoe Community College	Lake Tahoe	2	11
Lassen Community College	Susanville	2	5
Mendocino College	Ukiah	3	4
Napa Valley College	Napa	1	17
College of the Redwoods	Eureka	4	16
Santa Rosa Junior College	Santa Rosa	9	50
Shasta College	Redding	8	62
Sierra College	Rocklin	2	30
Solano Community College	Fairfield	1	5
Woodland Community College	Woodland	5	11
Yuba College	Marysville	1	1
South Central/Inland Region	**13**	**460**	
Allan Hancock College	Santa Maria	7	37
Antelope Valley College	Lancaster	1	4
Bakersfield College	Bakersfield	6	128
College of the Canyons	Santa Clarita	2	12
Citrus College	Glendora	1	44
Cuesta College	San Luis Obispo	4	31
El Camino College	Torrance	1	6
Hartnell College	Salinas	4	82
Los Angeles Pierce College	Woodland Hills	3	9
Long Beach City College	Long Beach	1	15
Monterey Peninsula College	Monterey	1	8
Mt San Antonio College	Walnut	7	40
Pasadena City College	Pasadena	1	1
Santa Barbara City College	Santa Barbara	2	4
Ventura College	Ventura	2	12
Victor Valley College	Victorville	4	20
West Los Angeles College	Culver City	1	7
South San Joaquin Valley Region	**11**	**700**	
Fresno City College	Fresno	1	3

Region/Community College	City	Count of Programs	3-Year Average Awards
Madera Community College	Madera	2	6
Merced College	Merced	5	112
Porterville College	Porterville	2	17
Reedley College	Reedley	7	435
College of the Sequoias	Visalia	6	40
Coaling College	Coalinga	4	86
Southern Region	**9**	**154**	
Cuyamaca College	El Cajon	4	8
College of the Desert	Palm Desert	5	50
Fullerton College	Fullerton	2	3
Golden West College	Huntington Beach	1	6
Imperial Valley College	Imperial	3	8
MiraCosta College	Oceanside	3	10
Mt. San Jacinto College	San Jacinto	2	4
Orange Coast College	Costa Mesa	1	12
Saddleback College	Mission Viejo	2	45
San Diego City College	San Diego	1	5
Southwestern College	Chula Vista	2	4
California Total	**14**	**1,881**	

Source: California Community Colleges Chancellor's Management Information Systems DataMart.

Exhibit 47 displays the annual job openings for entry-level positions in the specialty crop industry and the average number of community college awards in programs related to specialty crops. Across all regions, the number of projected annual job openings far exceeds the number of community college awards issued over the last three years. Annual job openings and community college awards indicate that community colleges could expand program offerings to meet the demand for specialty crop workers.

Exhibit 47. California Community College specialty crop awards and average annual job openings by region, 2023–2028

Region	Average Annual Job Openings (2023-2028)	Community College Average Annual Awards (2020-2023)
North San Joaquin/Coastal	5,092	202
North State/Bay Area	6,237	365
South Central/Inland	25,001	460
South San Joaquin Valley	14,447	700
Southern Region	3,793	154

Four-Year Education Programs

On average, four-year institutions in California have issued 1,089 bachelor's degrees annually in programs related to specialty crops. Four-year institutions use 17 program codes to train specialty crop workers. Specialty crop bachelor's degrees are concentrated in the top three program codes issuing awards, accounting for 60% on average. Exhibit 48 displays the number of bachelor's degrees issued by four-year institutions in programs related to specialty crops.

Exhibit 48. Four-year institution specialty crop awards by program, California, 2020–2023

CIP Program - CIP Title	2020 Awards	2021 Awards	2022 Awards	2023 Awards	Four-Year Average
01.0000 - Agriculture, General	110	142	103	105	115
01.0101 - Agricultural Business and Management, General	-	-	-	-	-
01.0102 - Agribusiness/Agricultural Business Operations	392	369	344	362	367
01.0199 - Agricultural Business and Management, Other	10	11	11	12	11
01.0201 - Agricultural Mechanization, General	17	42	40	31	33
01.0308 - Agroecology and Sustainable Agriculture	37	35	33	48	38
01.0603 - Ornamental Horticulture	-	1	1	-	1
01.0701 - International Agriculture	23	11	13	12	15
01.1001 - Food Science	199	191	150	148	172
01.1002 - Food Technology and Processing	15	8	8	7	10
01.1004 - Viticulture and Enology	87	80	81	67	79
01.1099 - Food Science and Technology, Other	37	30	20	25	28
01.1101 - Plant Sciences, General	40	39	38	32	37
01.1102 - Agronomy and Crop Science	64	63	70	104	75
01.1103 - Horticultural Science	-	-	-	-	-
01.1105 - Plant Protection and Integrated Pest Management	114	102	86	96	100
01.1106 - Range Science and Management	8	12	8	5	8
01.1201 - Soil Science and Agronomy, General	2	-	-	-	1
01.9999 - Agricultural/Animal/Plant/Veterinary Science and Related Fields, Other	-	2	1	-	1
Total	**1,155**	**1,138**	**1,007**	**1,054**	**1,089**

Source: National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS).

Bachelor's degree-awarding institutions are displayed by region in Exhibit 49 as well as the number of words issued annually over the last four years. The South Central/Inland Region has issued the most awards over the last four years, largely due California Polytechnic State University-San Luis Obispo, individually issuing nearly one-third of the State's specialty crop bachelor's degrees. The Southern Region did not issue specialty crop bachelor's degrees over this time period.

Exhibit 49. Four-Year institution specialty crop awards by institution, California, 2020-2023

Four-Year Institution (College Location)	2020 Awards	2021 Awards	2022 Awards	2023 Awards	Four-Year Average
North San Joaquin/Coastal					
California State University-Stanislaus (Turlock)	17	35	29	23	26
University of California-Santa Cruz (Santa Cruz)	11	19	19	26	19
North State/Bay Area					
University of California-Davis (Davis)	217	166	140	158	170
California State University-Chico (Chico)	135	162	137	139	143
California State Polytechnic University-Humboldt (Arcata)	8	12	8	5	8
Sonoma State University	-	-	-	-	-
South Central/Inland					
California Polytechnic State University-San Luis Obispo (San Luis Obispo)	369	373	338	324	351
California State Polytechnic University-Pomona (Pomona)	102	98	69	95	91
California State University-Bakersfield (Bakersfield)	20	19	19	23	20
California State University-Los Angeles (Los Angeles)	15	8	8	7	10
California State University-Monterey Bay(Seaside)	-	-	6	27	8
Pitzer College (Claremont)	-	-	-	1	0
South San Joaquin Valley					
California State University-Fresno (Fresno)	261	246	234	226	242
Total	**1,155**	**1,138**	**1,007**	**1,054**	**1,089**

Source: National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS).

Note: While this report draws upon data from California's secondary, adult education, and postsecondary systems to assess training availability, it may not capture all relevant workforce preparation programs, particularly those offered by private training providers, nonprofit organizations, or informal employer-led initiatives. The authors welcome feedback and suggestions to improve the completeness and accuracy of future analyses. Please contact us with additional information or questions related to training offerings not reflected in this report.

KEY FINDINGS

Overall, the specialty crop industry in California is growing steadily, with job growth concentrated in support services and processing rather than direct crop production. However, the current workforce training and education infrastructure does not proportionally align with demand, leading to potential labor preparation mismatches. Upskilling workers, expanding training programs, and addressing workforce recruitment challenges are key priorities for sustaining industry growth.

Training System Misalignment

California's education and workforce training system is not comprehensively addressing the need for skilled workers in the specialty crop industry. The bulk of workforce demand is for occupational roles that are not traditionally associated with postsecondary education and training. As a result, community colleges, four-year institutions, K-12 programs, and adult education programs seem inadequate or out of proportion to occupational need, limiting the supply of qualified workers.

- **Community colleges:** Regional disparities exist, with the South San Joaquin Valley Region producing the most graduates despite having fewer colleges, while the Southern Region issues only 8.2% of statewide awards. High-demand programs, such as agriculture technology, crop processing, and agribusiness management, need expansion to address workforce shortages.
- **Four-year colleges and universities:** Similarly, four-year institutions award more than one thousand specialty crop-related degrees annually, but most are from just a few schools, with no degree programs available in the Southern Region. California Polytechnic State University-San Luis Obispo alone produces nearly one-third of all graduates, highlighting a lack of geographic diversity in training opportunities.
- **K-12 districts:** K-12 agricultural education programs demonstrate strong interest in the field. However, career pathways are misaligned with workforce needs, with more students focusing on agricultural mechanics rather than plant and soil science or agribusiness. A lack of tracking students post-graduation prevents educators from understanding how many K-12 students transition into agriculture-related careers or higher education. Expanding career awareness initiatives and transition programs would help connect K-12 graduates to industry jobs or postsecondary training.

- **Adult education programs:** Adult education remains an underutilized resource for workforce training, with just 2% of workforce programs focused on agriculture. There are 21 agriculture-related adult education programs statewide; most focus on animal science rather than specialty crops. Additionally, language barriers limit career mobility, as 35% of farmworkers cannot speak English and 47% cannot read English.[39] Expanding short-term training in crop technology, farm management, and English as a Second Language (ESL) could help upskill farmworkers and improve employment outcomes.

Shifting Employment Dynamics

While overall employment in California's specialty crop industries is projected to grow by 4.1% through 2028, the majority of job gains are expected in support services and crop processing rather than direct crop production, which is forecast to decline slightly. More than 507,000 workers were employed across nearly 17,900 establishments in 2023, with 44.3% in support services, 40.9% in production, and 14.8% in processing.

Sectoral Volatility and Data Limitations

Projections based on historical data may not fully account for recent shifts. For example, while wine grape employment was projected to grow, more recent trends indicate oversupply and declining demand. Vineyard acreage has been converted or abandoned in some areas, suggesting the need for more responsive data and planning.[40]

Regional Employment Concentration and Growth

The South Central/Inland and South San Joaquin Valley regions account for over 65% of statewide employment and are expected to drive much of the projected job growth. The North State/Bay Area Region, though smaller in overall employment, is projected to contribute over 20% of the state's growth in specialty crop jobs. These trends underscore the importance of regional specialization and the need for targeted investment.

Challenges Meeting Workforce Demand

The specialty crop industry faces a critical workforce challenge, with 25 entry-level occupations expected to generate 54,509 annual job openings over the next five years (See Appendix D for list of specialty crop occupations). However, meeting this demand is complicated by limited employer reliance on job postings, making it difficult for job seekers to connect with available opportunities.

Farm labor contractors and crew leaders are projected to account for nearly two-thirds of total employment growth through 2028. Processing operations are also expected to see continued expansion. Despite this, workforce development resources for this area of work remains limited.

Challenges in Recruitment and Advancement

Unlike other industries, agriculture employers post significantly fewer job ads per job opening. In 2023, California's overall industry average was 5.3 jobs per job ad, while the specialty crop industry had a staggering 58.3 jobs per job ad. This suggests that traditional job posting platforms do not effectively capture workforce needs, leaving a substantial gap in recruitment efforts.

Additionally, 70% of farmworkers secure jobs through informal referrals from family or friends rather than through public job postings. This reliance on word-of-mouth hiring limits employer visibility among potential new workers and restricts access for job seekers outside existing networks.

Need for Skills-Based and Flexible Training Models

Employers increasingly report the need for workers skilled in maintenance, equipment operation, and food safety. Yet training offerings often do not reflect these occupational areas, and flexible delivery options—such as short-term, modular, bilingual, or evening formats—are underutilized.

These findings emphasize the urgency of rethinking and restructuring workforce development strategies across California's specialty crop regions. A regionally targeted, skills-aligned, and flexible workforce training system will be essential to sustaining the future of the industry.

RECOMMENDATIONS

California's long-term competitiveness in specialty agriculture depends on a coordinated strategy to modernize workforce development, ensure regional equity, and prioritize investments that lead to stable, upwardly mobile employment. The findings of this report highlight the need for regionally targeted improvements that better align workforce supply with employer demand. To that end, the recommendations below outline actionable strategies tailored to four key stakeholder groups: policymakers, employers, education and training providers, and job seekers.

Expand and Revise Based on Regional Need.

- **South San Joaquin Valley Region:** Despite issuing the most specialty crop-related community college awards, this region still faces a high demand for skilled workers. Expanding agriculture power equipment technology, crop processing, and agribusiness programs can help meet employer needs.
- **Southern Region:** With the fewest specialty crop training programs, this region should prioritize adding horticulture, plant science, and agribusiness courses in both community colleges and adult education programs to increase workforce readiness.
- **North State/Bay Area Region:** This region has a growing share of specialty crop employment, yet only 19.4% of statewide community college awards come from this area. Increasing offerings in food science, enology, and viticulture can better support the growing winery and crop processing industries.
- **Statewide:** Given the industry's reliance on manual labor and technical skills, expanding certificate programs and short-term vocational training—particularly in equipment maintenance, food processing, and irrigation technology—would provide immediate workforce benefits. To ensure these opportunities are accessible to learners, additional supports are essential to address common barriers to enrollment. This includes improving access to childcare, transportation, and other wraparound services that can enable consistent participation in education and training programs.

For Policymakers:

- **Align Investments with Regional Employment Concentration.** Reallocate resources to reflect regional concentrations of employment, particularly in the South Central/Inland and South San Joaquin Valley regions. Increased funding for local training and targeted credential programs is essential.
- **Redirect Investment Toward Growing Sectors and Occupations.** Support and processing sectors represent the majority of projected job growth. Training initiatives should pivot toward mechanical maintenance, food safety, and equipment operation occupations that meet real employer needs.
- **Leverage California Jobs First to Expand Regional Training Infrastructure:** The California Jobs First initiative could help drive new agriculture workforce initiatives, apprenticeships, and work-based learning programs that connect students with industry opportunities.
- **Commission a Statewide Wage Study for Specialty Crop Workers.** Policymakers should commission a comprehensive wage study to more accurately assess earnings across California's specialty crop workforce—disaggregated by region, occupation, and industry subsector. While current state data systems, such as those managed by the California Employment Development Department (EDD), provide valuable estimates of agricultural employment and average wages—including analysis of multiple job holders—they do not fully capture the income complexity faced by many specialty crop workers.

  A significant portion of this workforce is employed seasonally, works for multiple employers in a single year, or is hired indirectly through farm labor contractors. These employment arrangements obscure individual income patterns, complicate wage calculations, and limit the accuracy of traditional wage datasets. Additionally, informal hiring practices and underreporting further distort labor market visibility, particularly for production occupations.

  A focused, field-informed wage study would strengthen the state's understanding of economic conditions across the specialty crop sector and support more equitable workforce planning. Improved data would inform wage support policies, guide training investments, and help evaluate the impact of job quality initiatives aimed at economic mobility for California's agricultural workers.

For Employers:

- **Enhance Visibility of Job Opportunities.** Many specialty crop employers rely on word-of-mouth hiring rather than traditional job postings, limiting access for new workers. Employers should be encouraged to expand recruitment efforts through online job postings, mobile-friendly job ads, bilingual outreach, and in-person recruitment efforts in rural and farmworker communities. They should also partner with community outreach programs and local workforce agencies.
- **Provide Business Development Support.** For employers who may lack the resources or technical knowledge to effectively recruit online, provide free or low-cost digital hiring tools, training workshops, and bilingual recruitment materials to help encourage online hiring practices.
- **Engage as Curricula and Training Partners.** Collaborate with training and education providers to co-design training pathways, document on-the-job learning, and provide input into curriculum development. Stronger industry-education partnerships will increase job placement rates and worker retention.
- **Support Incumbent Worker Advancement.** Upskilling the existing workforce is essential to filling mid-level and technical roles. Employers and educators should develop shared approaches to mentorship, tuition assistance, and paid training time.
- **Expand Employer Use of the Employment Training Panel (ETP).** Employers should leverage California's Employment Training Panel (ETP) program to offset the cost of training and onboarding workers in high-demand specialty crop roles, including equipment operators, food safety technicians, and maintenance workers. These occupations typically do not require college degrees but do necessitate targeted, short-term training to ensure job readiness and workplace safety.

  Given projected growth of 7.1% and 7.5% in the crop support and processing subsectors, respectively, employers in these areas are well-positioned to benefit from ETP resources. Doing so can enhance worker productivity, retention, and mobility while reducing the financial burden of training investments—ultimately strengthening the capacity of California's specialty crop workforce.

In particular, the **ETP Seasonal Worker Pilot Program**, established in 2007, was designed specifically to fund training for workers in the agricultural crop production industry. The program could be leveraged or expanded to support training in areas such as forklift operation and food safety (Hazard Analysis Critical Control Point (HACCP) certification). Doing so could help ensure that seasonal workers—many of whom face barriers to long-term employment—receive relevant, portable credentials that improve job quality, retention, and mobility across California's specialty crop sector.

For Education and Training Providers:

- **Strengthen Employer-Education Partnerships to Align Programs with Industry Needs.** California's community colleges and adult education programs should formalize partnerships with specialty crop employers to co-develop curricula, align stackable credentials with occupational roles, and expand delivery through hybrid and bilingual formats. The report identifies a disconnect between current training offerings and actual workforce needs—especially in agriculturally concentrated regions like the Central Valley—where education programs often lack sufficient relevance, flexibility, or visibility.

  Embedding employer input into program design, and emphasizing modular, short-term instruction, can help address labor shortages while improving worker advancement. Programs should prioritize in-demand certifications such as Hazard Analysis Critical Control Point (HACCP), forklift operation, OSHA-10, and basic mechanical safety to better prepare workers for employment in processing, logistics, and machinery maintenance roles.
- **Embed Industry-Recognized Certifications Across Programs.** Education and training providers should integrate recognized credentials into curricula to improve job readiness. These include, but are not limited to, OSHA-10, forklift operation, HACCP, and basic mechanical safety.
- **Expand Flexible and Contextualized Learning Models.** Programs that offer short-term, modular, bilingual, and evening or hybrid instruction are more accessible to working learners. Institutions should invest in delivery models that meet the scheduling needs of the current workforce.

- **Develop Adult Education and Upskilling Programs:** With many farmworkers lacking formal education, scaling up adult education programs in agriculture technology, agribusiness, and English as a Second Language (ESL) can help upskill the current workforce and provide pathways for career advancement.
- **Increase Dual Enrollment & Career Exposure for K-12 Students:** Establishing dual enrollment pathways in agriculture education between high schools and community colleges can expose students to specialty crop careers earlier and create a seamless transition into the workforce.
- **Respond to Sector-Specific Shifts.** Training systems must adapt more rapidly to economic changes, such as declining demand in the wine grape sector.[41] Real-time data collection and feedback loops will help ensure programs remain relevant.

For Job Seekers:

- **Expand digital recruitment strategies.** Many farmworkers may not regularly search for jobs online due to restricted access, language barriers, digital literacy gaps, or a lack of familiarity with job search platforms. Creating mobile-friendly, multilingual job postings and working with community organizations to assist job seekers can improve engagement and increase application rates. Traditional farmworkers, many of whom lack internet access or digital literacy, may not engage with online job postings, while younger K-12 students preparing to enter the workforce are more accustomed to digital environments.
- **Pursue Industry-Aligned Certifications and Short-Term Training:** Many high-demand roles in specialty crops require targeted skills rather than four-year degrees. Job seekers can improve their employability by pursuing short-term training in equipment operation, maintenance, food safety, and irrigation technology.
- **Utilize Workforce and Community-Based Resources:** Regional workforce development boards, adult education programs, and community colleges offer career counseling, training stipends, and job placement services that can support career advancement.
- **Engage in ESL and Digital Literacy Programs:** For those with limited English proficiency or digital skills, engaging in local ESL or digital literacy courses can improve access to job opportunities and support long-term mobility.
- **Explore Dual Enrollment and Career Exposure Opportunities:** K-12 students interested in agriculture careers should consider dual enrollment programs or internships that provide exposure to specialty crop occupations and related technical education.

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APPENDICES

Appendix A: Specialty Crop Industry Definition

Industry (NAICS)	Industry Description
Crop Production (111000)	Industries in the Crop Production subsector grow crops mainly for food and fiber. The subsector comprises establishments, such as farms, orchards, groves, greenhouses, and nurseries, primarily engaged in growing crops, plants, vines, or trees and their seeds.
Vegetable and Melon Farming (1112)	
Potato Farming (111211)	This U.S. industry comprises establishments primarily engaged in growing potatoes and/or producing seed potatoes.
Other Vegetable (except Potato) and Melon Farming (111219)	This U.S. industry comprises establishments primarily engaged in one or more of the following: (1) growing melons and/or vegetables (except potatoes; dry peas; dry beans; field, silage, or seed corn; and sugar beets); (2) producing vegetable and/or melon seeds; and (3) growing vegetable and/or melon bedding plants.
Fruit and Tree Nut Farming (1113)	
Orange Groves (111310)	This industry comprises establishments primarily engaged in growing oranges.
Citrus (except Orange) Groves (111320)	This industry comprises establishments primarily engaged in growing citrus fruits (except oranges).
Apple Orchards (111331)	This U.S. industry comprises establishments primarily engaged in growing apples.
Grape Vineyards (111332)	This U.S. industry comprises establishments primarily engaged in growing grapes and/or growing grapes to sun dry into raisins.
Strawberry Farming (111333)	This U.S. industry comprises establishments primarily engaged in growing strawberries.
Berry (except Strawberry) Farming (111334)	This U.S. industry comprises establishments primarily engaged in growing berries.
Tree Nut Farming (111335)	This U.S. industry comprises establishments primarily engaged in growing tree nuts.
Fruit and Tree Nut Combination Farming (111336)	This U.S. industry comprises establishments primarily engaged in growing a combination of fruit(s) and tree nut(s) with no one fruit (or family of fruit) or family of tree nuts accounting for one-half of the establishment's agricultural production (i.e., value of crops for market).
Other Noncitrus Fruit Farming (111339)	This U.S. industry comprises establishments primarily engaged in growing noncitrus fruits (except apples, grapes, berries, and fruit(s) and tree nut(s) combinations).

Industry (NAICS)	Industry Description
Greenhouse, Nursery, and Floriculture Production (1114)	
Mushroom Production (111411)	This U.S. industry comprises establishments primarily engaged in growing mushrooms under cover in mines underground, or in other controlled environments.
Other Food Crops Grown Under Cover (111419)	This U.S. industry comprises establishments primarily engaged in growing food crops (except mushrooms) under glass or protective cover.
Nursery and Tree Production (111421)	This U.S. industry comprises establishments primarily engaged in (1) growing nursery products, nursery stock, shrubbery, bulbs, fruit stock, sod, and so forth, under cover or in open fields and/or (2) growing short rotation woody trees with a growth and harvest cycle of 10 years or less for pulp or tree stock.
Floriculture Production (111422)	This U.S. industry comprises establishments primarily engaged in growing and/or producing floriculture products (e.g., cut flowers and roses, cut cultivated greens, potted flowering and foliage plants, and flower seeds) under cover and in open fields.
Other Crop Farming (1119)	
All Other Miscellaneous Crop Farming (111998)	This U.S. industry comprises establishments primarily engaged in one of the following: (1) growing crops (except oilseeds and/or grains; vegetables and/or melons; fruits and/or tree nuts; greenhouse, nursery, and/or floriculture products; tobacco; cotton; sugarcane; hay; sugar beets; or peanuts); (2) growing a combination of crops (except a combination of oilseed(s) and grain(s); and a combination of fruit(s) and tree nut(s)) with no one crop or family of crops accounting for one-half of the establishment's agricultural production (i.e., value of crops for market); or (3) gathering tea or maple sap.
Aquaculture (1125)	
Other Aquaculture (112519)	This U.S. industry comprises establishments primarily engaged in (1) farm raising of aquatic animals (except finfish and shellfish) and/or (2) farm raising of aquatic plants. Alligator, algae, frog, seaweed, or turtle production is included in this industry.
Other Animal Production (1129)	
Apiculture (112910)	This industry comprises establishments primarily engaged in raising bees. These establishments may collect and gather honey; and/or sell queen bees, packages of bees, royal jelly, bees' wax, propolis, venom, pollen, and/or other bee products.
Forest Nurseries and Gathering of Forest Products (1132)	
Forest Nurseries and Gathering of Forest Products (113210)	This industry comprises establishments primarily engaged in (1) growing trees for reforestation and/or (2) gathering forest products, such as gums, barks, balsam needles, rhizomes, fibers, Spanish moss, ginseng, and truffles.

Industry (NAICS)	Industry Description
Support Activities for Crop Production (1151)	
Soil Preparation, Planting, and Cultivating (115112)	This U.S. industry comprises establishments primarily engaged in performing a soil preparation activity or crop production service, such as plowing, fertilizing, seed bed preparation, planting, cultivating, and crop protecting services.
Crop Harvesting, Primarily by Machine (115113)	This U.S. industry comprises establishments primarily engaged in mechanical harvesting, picking, and combining of crops, and related activities. The machinery used is provided by the servicing establishment.
Postharvest Crop Activities (except Cotton Ginning) (115114)	This U.S. industry comprises establishments primarily engaged in performing services on crops, subsequent to their harvest, with the intent of preparing them for market or further processing. These establishments provide postharvest activities, such as crop cleaning, sun drying, shelling, fumigating, curing, sorting, grading, packing, and cooling.
Farm Labor Contractors and Crew Leaders (115115)	This U.S. industry comprises establishments primarily engaged in supplying labor for agricultural production or harvesting.
Farm Management Services (115116)	This U.S. industry comprises establishments primarily engaged in providing farm management services on a contract or fee basis usually to citrus groves, orchards, or vineyards. These establishments always provide management and may arrange or contract for the partial or the complete operations of the farm establishment(s) they manage. Operational activities may include cultivating, harvesting, and/or other specialized agricultural support activities.
Fruit and Vegetable Preserving and Specialty Food Manufacturing (3114)	
Frozen Fruit, Juice, and Vegetable Manufacturing (311411)	This U.S. industry comprises establishments primarily engaged in manufacturing frozen fruits; frozen vegetables; and frozen fruit juices, ades, drinks, cocktail mixes and concentrates.
Fruit and Vegetable Canning (311421)	This U.S. industry comprises establishments primarily engaged in manufacturing canned, pickled, and brined fruits and vegetables. Examples of products made in these establishments are canned juices; canned jams and jellies; canned tomato-based sauces, such as catsup, salsa, chili sauce, spaghetti sauce, barbeque sauce, and tomato paste; and pickles, relishes, and sauerkraut.
Dried and Dehydrated Food Manufacturing (311423)	This U.S. industry comprises establishments primarily engaged in (1) drying (including freeze-dried) and/or dehydrating fruits, vegetables, and soup mixes and bouillon and/or (2) drying and/or dehydrating ingredients and packaging them with other purchased ingredients, such as rice and dry pasta
Other Food Manufacturing (3119)	
Perishable Prepared Food Manufacturing (311991)	This U.S. industry comprises establishments primarily engaged in manufacturing perishable prepared foods, such as salads, sandwiches, prepared meals, fresh pizza, fresh pasta, and peeled or cut vegetables.

Source: North American Industry Classification System (NAICS), https://www.census.gov/naics/.

Appendix B: Specialty Crop Industry Groups

Industry (NAICS)	Industry Group
Potato Farming (111211)	Production
Other Vegetable (except Potato) and Melon Farming (111219)	Production
Orange Groves (111310)	Production
Citrus (except Orange) Groves (111320)	Production
Apple Orchards (111331)	Production
Grape Vineyards (111332)	Production
Strawberry Farming (111333)	Production
Berry (except Strawberry) Farming (111334)	Production
Tree Nut Farming (111335)	Production
Fruit and Tree Nut Combination Farming (111336)	Production
Other Noncitrus Fruit Farming (111339)	Production
Mushroom Production (111411)	Production
Other Food Crops Grown Under Cover (111419)	Production
Nursery and Tree Production (111421)	Production
Floriculture Production (111422)	Production
All Other Miscellaneous Crop Farming (111998)	Production
Other Aquaculture (112519)	Production
Apiculture (112910)	Production
Forest Nurseries and Gathering of Forest Products (113210)	Production
Soil Preparation, Planting, and Cultivating (115112)	Support
Crop Harvesting, Primarily by Machine (115113)	Support
Postharvest Crop Activities (except Cotton Ginning) (115114)	Support
Farm Labor Contractors and Crew Leaders (115115)	Support
Farm Management Services (115116)	Support
Frozen Fruit, Juice, and Vegetable Manufacturing (311411)	Processing
Fruit and Vegetable Canning (311421)	Processing
Dried and Dehydrated Food Manufacturing (311423)	Processing
Perishable Prepared Food Manufacturing (311991)	Processing
Wineries (312130)	Processing

Appendix C: Specialty Crop Regions

County	CDFA Region	California Community College Region
Alameda	North San Joaquin/Coastal	Bay Area
Alpine	North San Joaquin/Coastal	Central Valley
Amador	North San Joaquin/Coastal	Central Valley
Calaveras	North San Joaquin/Coastal	Central Valley
Contra Costa	North San Joaquin/Coastal	Bay Area
Inyo	North San Joaquin/Coastal	Central Valley
Mariposa	North San Joaquin/Coastal	Central Valley
Mono	North San Joaquin/Coastal	Central Valley
San Francisco	North San Joaquin/Coastal	Bay Area
San Joaquin	North San Joaquin/Coastal	Central Valley
San Mateo	North San Joaquin/Coastal	Bay Area
Santa Clara	North San Joaquin/Coastal	Bay Area
Santa Cruz	North San Joaquin/Coastal	Bay Area
Stanislaus	North San Joaquin/Coastal	Central Valley
Tuolumne	North San Joaquin/Coastal	Central Valley
Butte	North State/Bay Area	Far North
Colusa	North State/Bay Area	Far North
Del Norte	North State/Bay Area	Far North
El Dorado	North State/Bay Area	Greater Sacramento
Glenn	North State/Bay Area	Far North
Humboldt	North State/Bay Area	Far North
Lake	North State/Bay Area	Far North
Lassen	North State/Bay Area	Far North
Marin	North State/Bay Area	Bay Area
Mendocino	North State/Bay Area	Far North
Modoc	North State/Bay Area	Far North
Napa	North State/Bay Area	Bay Area
Nevada	North State/Bay Area	Greater Sacramento
Placer	North State/Bay Area	Greater Sacramento
Plumas	North State/Bay Area	Far North
Sacramento	North State/Bay Area	Greater Sacramento
Shasta	North State/Bay Area	Far North
Sierra	North State/Bay Area	Far North

County	CDFA Region	California Community College Region
Siskiyou	North State/Bay Area	Far North
Solano	North State/Bay Area	Bay Area
Sonoma	North State/Bay Area	Bay Area
Sutter	North State/Bay Area	Greater Sacramento
Tehama	North State/Bay Area	Far North
Trinity	North State/Bay Area	Far North
Yolo	North State/Bay Area	Greater Sacramento
Yuba	North State/Bay Area	Greater Sacramento
Kern	South Central/Inland	Central Valley
Los Angeles	South Central/Inland	Los Angeles County
Monterey	South Central/Inland	Bay Area
San Benito	South Central/Inland	Bay Area
San Bernardino	South Central/Inland	Inland Empire/Desert
San Luis Obispo	South Central/Inland	South Central Coast
Santa Barbara	South Central/Inland	South Central Coast
Ventura	South Central/Inland	South Central Coast
Fresno	South San Joaquin Valley	Central Valley
Kings	South San Joaquin Valley	Central Valley
Madera	South San Joaquin Valley	Central Valley
Merced	South San Joaquin Valley	Central Valley
Tulare	South San Joaquin Valley	Central Valley
Imperial	Southern Region	San Diego-Imperial
Orange	Southern Region	Orange County
Riverside	Southern Region	Inland Empire/Desert
San Diego	Southern Region	San Diego-Imperial

Appendix D: Specialty Crop Occupations

Occupation (SOC Code)	Specialty Crop Industry Employment (2023 Jobs)	Share of Jobs Employed in the Specialty Crops Industry	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training
Specialty Crop Production Occupations					
Farmers, Ranchers, and Other Agricultural Managers (11-9013)	57,920	98%	HS diploma or equivalent	5 years or more	None
Farmworkers, Farm, Ranch, and Aquacultural Animals (45-2093)	20,087	92%	No formal educational credential	None	<1 Month
Agricultural Equipment Operators (45-2091)	15,232	92%	No formal educational credential	None	1-12 Months
Agricultural Workers, All Other (45-2099)	12,997	91%	No formal educational credential	None	<1 Month
Agricultural Technicians (19-4012)	1,065	32%	Associate degree	None	1-12 Months
Forest and Conservation Workers (45-4011)	343	10%	HS diploma or equivalent	None	1-12 Months
Specialty Crop Support Occupations					
Farmworkers and Laborers, Crop, Nursery, and Greenhouse (45-2092)	203,976	91%	No formal educational credential	None	<1 Month
Packers and Packagers, Hand (53-7064)	12,447	13%	No formal educational credential	None	<1 Month
First-Line Supervisors of Farming, Fishing, and Forestry Workers (45-1011)	10,770	78%	HS diploma or equivalent	Less than 5 years	None
Graders and Sorters, Agricultural Products (45-2041)	7,132	85%	No formal educational credential	None	<1 Month
Farm Equipment Mechanics and Service Technicians (49-3041)	1,549	37%	HS diploma or equivalent	None	>12 Months
Pesticide Handlers, Sprayers, and Applicators, Vegetation (37-3012)	967	39%	HS diploma or equivalent	None	1-12 Months

Occupation (SOC Code)	Specialty Crop Industry Employment (2023 Jobs)	Share of Jobs Employed in the Specialty Crops Industry	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training
Cutting and Slicing Machine Setters, Operators, and Tenders (51-9032)	510	14%	HS diploma or equivalent	None	1-12 Months
Farm Labor Contractors (13-1074)	236	94%	No formal educational credential	Less than 5 years	<1 Month
Specialty Crop Processing Occupations					
Packaging and Filling Machine Operators and Tenders (51-9111)	9,935	23%	HS diploma or equivalent	None	1-12 Months
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders (51-9012)	4,145	40%	HS diploma or equivalent	None	1-12 Months
Food Batchmakers (51-3092)	2,861	22%	HS diploma or equivalent	None	1-12 Months
Food Processing Workers, All Other (51-3099)	1,479	18%	No formal educational credential	None	1-12 Months
Food Science Technicians (19-4013)	1,179	28%	Associate's degree	None	1-12 Months
Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders (51-9192)	923	29%	HS diploma or equivalent	None	1-12 Months
Food Cooking Machine Operators and Tenders (51-3093)	900	27%	HS diploma or equivalent	None	1-12 Months
Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders (51-3091)	444	30%	No formal educational credential	None	1-12 Months
Cooling and Freezing Equipment Operators and Tenders (51-9193)	150	22%	HS diploma or equivalent	None	1-12 Months

Appendix E: Specialty Crops Workforce Survey

The COE's Specialty Crops Workforce Survey was distributed to specialty crop employers across California. The survey received responses from 189 employers, representing a combined workforce of nearly 18,800 employees statewide. While responses were recorded in all specialty crop workforce development regions, of the 183 employers that identified their region, approximately two-thirds originated from employers operating in the North State/Bay Area and North San Joaquin/Coastal regions.

Among the 175 respondents who identified their primary business activity, 78% listed crop production activities as their primary business function, followed by crop support services (16%) and crop processing (6%). Secondary functions were more evenly distributed: 48% of employers reported engaging in crop support, 35% in crop production, and 17% in crop processing.

Regarding workforce composition, employers indicated that 52% of their employees were seasonal, while 48% were employed year-round. Notably, this ratio reversed among employers with more than 1,000 employees, where 48% of workers were seasonal and 52% were year-round employees. Across all respondents, a majority (58%) of workers were directly employed, compared to 42% who were contract workers. This trend was more pronounced among smaller employers (fewer than 50 employees), 66% of whom directly employed their workforce.

Word-of-mouth recruitment was the most commonly cited hiring method, used by 87% of respondents. Other recruitment strategies included online job boards (35%), partnerships with local educational institutions (25%), and social media platforms (23%). On-the-job training emerged as the predominant form of professional development, reported by approximately 75% of employers. However, more than half of respondents indicated limited opportunities for advancement within their organizations.

Metrics	North San Joaquin/ Coastal	North State/Bay Area	South Central/ Inland	South San Joaquin Valley	Southern Region	Grand Total
Employer Responses	**46**	**75**	**28**	**18**	**16**	**183**
Employers with more than 1,000 employees	3	1	0	0	0	4
Employers with 100 to 999 employees	8	3	3	5	5	24
Employers with 50 to 99 employees	6	4	5	1	1	17
Employers with fewer than 50 employees	29	67	20	12	10	138
Total Employee Count	**9,348**	**3,181**	**1,912**	**1,548**	**836**	**16,825**
Responses by Primary Activity						
Crop Production	29	58	23	12	11	133
Crop Support	7	8	3	2	5	25
Crop Processing	5	4	2	0	0	11
Responses by Secondary Activity						
Crop Production	13	18	6	4	6	47
Crop Support	11	27	16	5	6	65
Crop Processing	4	17	2	0	1	24

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The Centers of Excellence (COE) for Labor Market Research deliver regional workforce research and technical expertise to California Community Colleges for program decision making and resource development. This information has proven valuable to colleges in beginning, revising, or updating economic development and Career Education (CE) programs, strengthening grant applications, assisting in the accreditation process, and supporting strategic planning efforts.

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