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Labor Market Analysis

Plant Health



Prepared by Central Valley/Mother Lode Center of Excellence



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Summary

The Central Valley/Mother Lode Center of Excellence developed this report for College of the Sequoias to determine whether there is demand in the local labor market that is not being met by the supply from postsecondary programs. This report summarizes labor market demand, wages, skills, and postsecondary supply for:

- Farmers, Ranchers, and Other Agricultural Managers (SOC 11-9013)
- Pest Control Workers (SOC 37-2021)
- Pesticide Handlers, Sprayers, and Applicators, Vegetation (SOC 37-3012)

Key Findings

- **Occupational Demand** — Occupations related to *Plant Health* have a labor market demand of 1,826 annual job openings in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. Between 2023 and 2028, *Farmers, Ranchers, and Other Agricultural Managers* are projected to have the most demand with 1,614 annual job openings.
- **Wages** — The occupations studied in this report have a collective entry-level hourly wage (25th percentile) of \$16.71/hour, which is above the living wage in the SCV/SML subregion.¹
- **Employers and Job Titles** — Employers in the SCV/SML subregion include Orkin, Clark Pest Control, and Terminix. The most common job title is pest control technician.
- **Skills** — The most common baseline skill is communication; the most common specialized skill is pest control; and the most common software skill is Microsoft Excel.
- **Education** — A high school diploma or equivalent is typically required for *Farmers, Ranchers, and Other Agricultural Managers*; *Pest Control Workers*; and *Pesticide Handlers, Sprayers, and Applicators, Vegetation*.
- **Supply and Demand Analysis** — Based on 1,826 annual openings (i.e., demand) and an average of 264 postsecondary degrees awarded (i.e., supply), an analysis of supply and demand suggests there is an undersupply of 1,562 workers in the SCV/SML subregion. In the CVML region, 306 awards were conferred suggesting an undersupply of 2,329 workers (based on 2,635 annual openings in the CVML region).

Recommendation

Based on a comparison of supply and demand, there is an undersupply of trained workers in the SCV/SML subregion and the CVML region. The Center of Excellence recommends that College of the Sequoias work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of workers.

¹ The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

Introduction

The Central Valley/Mother Lode Center of Excellence developed this report to provide College of the Sequoias with labor market information for *Plant Health*. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional supply and demand data has been included for broader applicability and use. Analysis of the program and occupational data related to *Plant Health* is included in the report. The Standard Occupational Classification (SOC) System codes and occupational titles used in this report are from the Bureau of Labor Statistics and O*NET Online.

Farmers, Ranchers, and Other Agricultural Managers (SOC 11-9013)

- **Job Description:** Plan, direct, or coordinate the management or operation of farms, ranches, greenhouses, aquacultural operations, nurseries, timber tracts, or other agricultural establishments. May hire, train, and supervise farm workers or contract for services to carry out the day-to-day activities of the managed operation. May engage in or supervise planting, cultivating, harvesting, and financial and marketing activities.
- **Knowledge:** Food Administration and Management, Production and Processing, Biology, Mathematics, English Language
- **Skills:** Active Listening, Critical Thinking, Reading Comprehension, Complex Problem Solving, Management of Personnel Resources

Pest Control Workers (SOC 37-2021)

- **Job Description:** Apply or release chemical solutions or toxic gases and set traps to kill or remove pests and vermin that infest buildings and surrounding areas.
- **Knowledge:** Customer and Personal Service, Public Safety and Security, English Language
- **Skills:** Active Listening, Critical Thinking, Monitoring, Speaking, Writing

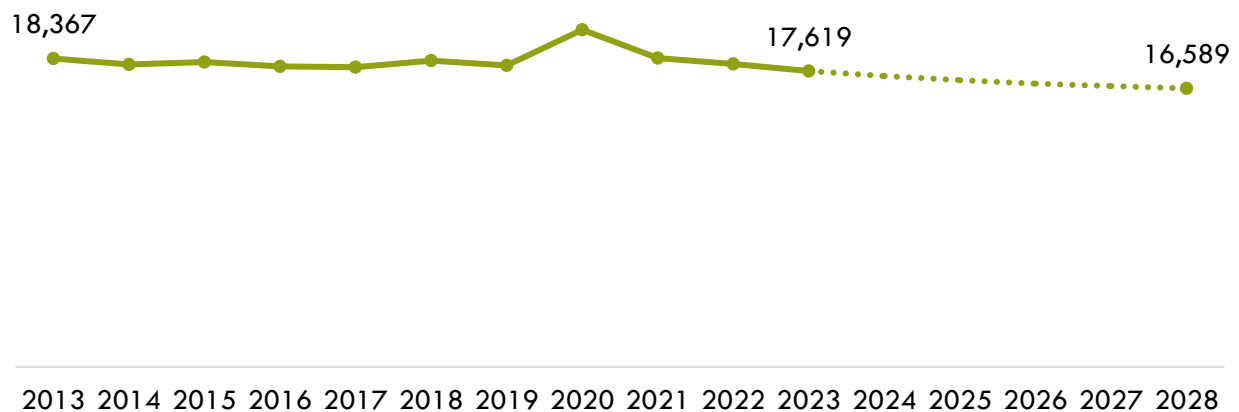
Pesticide Handlers, Sprayers, and Applicators, Vegetation (SOC 37-3012)

- **Job Description:** Mix or apply pesticides, herbicides, fungicides, or insecticides through sprays, dusts, vapors, soil incorporation, or chemical application on trees, shrubs, lawns, or crops. Usually requires specific training and state or federal certification.
- **Knowledge:** Biology, Customer and Personal Service, Production and Processing, English Language, Administration and Management
- **Skills:** Active Listening, Critical Thinking, Speaking, Time Management, Complex Problem Solving

Employment

Exhibit 1a shows the employment trends for *Plant Health-related occupations* in the SCV/SML subregion. Between 2023 to 2028, the number of **new** jobs for these occupations is projected to decrease by 1,030 (decline of 6%).

Exhibit 1a. Historical employment and projected demand for *Plant Health*-related occupations in the SCV/SML subregion, 2013-2028



Occupations related to *Plant Health* in the SCV/SML subregion employed 17,619 workers in 2023 (Exhibit 1b). *Farmers, Ranchers, and Other Agricultural Managers* are projected to have the most annual openings, 1,614.

Exhibit 1b. Current employment and projected occupational demand for occupations related to *Plant Health* in the SCV/SML subregion, 2023-2028

Occupation	2023 Jobs	2028 Jobs	5-Year Change	5-Year % Change	Annual Openings
Farmers, Ranchers, and Other Agricultural Managers	16,152	15,030	(1,122)	(7%)	1,614
Pest Control Workers	1,010	1,062	52	5%	144
Pesticide Handlers, Sprayers, and Applicators, Vegetation	457	497	41	9%	68
TOTAL	17,619	16,589	(1,030)	(6%)	1,826

Wages

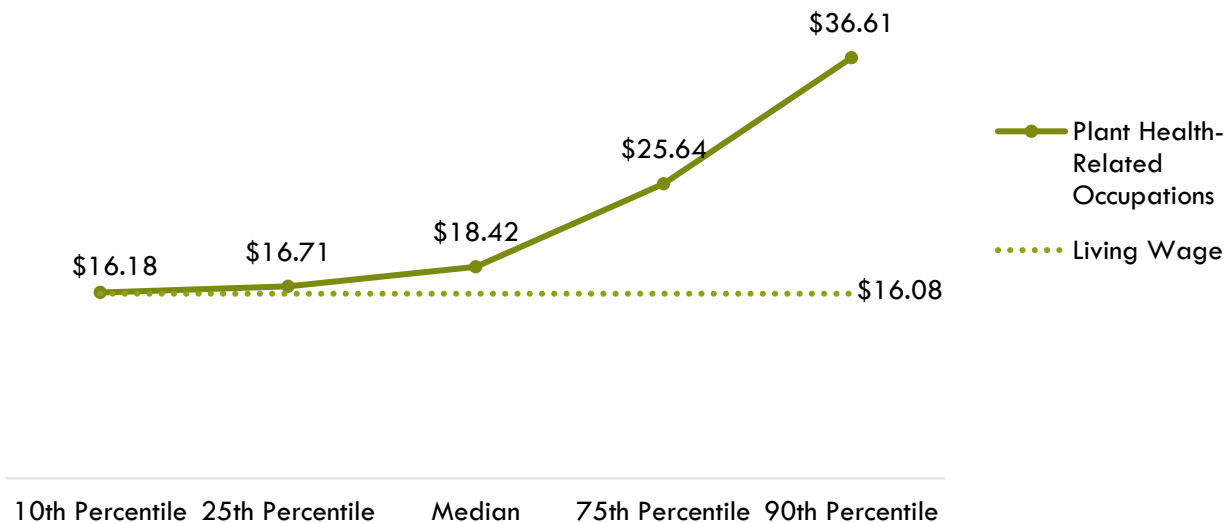
Exhibit 2a shows the hourly wages for the three occupations of interest.

Exhibit 2a. Hourly wages for occupations related to *Plant Health* in the SCV/SML subregion

Occupation	25 th Percentile Hourly Earnings	Median Hourly Earnings	75 th Percentile Hourly Earnings
Farmers, Ranchers, and Other Agricultural Managers	\$15.50	\$17.90	\$31.29
Pest Control Workers	\$17.25	\$18.51	\$23.86
Pesticide Handlers, Sprayers, and Applicators, Vegetation	\$17.39	\$18.85	\$21.78

Exhibit 2b shows the average hourly wages for the three occupations of interest; all five average hourly wages are above the living wage for the SCV/SML subregion.

Exhibit 2b. Average hourly wages for occupations related to *Plant Health* in the SCV/SML subregion



Job Postings

There were 480 unique job postings for occupations related to *Plant Health* in the SCV/SML subregion from November 2023 to October 2024.²

Top Employers

The employers with the most job postings are listed in Exhibit 3. The top employers in online job postings were Orkin, Clark Pest Control, and Terminix.

Exhibit 3. Top employers

Employer
Orkin
Clark Pest Control
Terminix
Official Pest Prevention
Foster Farms
GPAC
Grimmway Enterprises
Rentokil Initial
Mosquito-Joe
The Wonderful Company

Top Job Titles

Exhibit 4 shows the top job titles for occupations related to *Plant Health* in the SCV/SML subregion.

Exhibit 4. Top job titles

Job Title
Pest Control Technicians
Ranch Foremen
Pest Control Service Technicians
Pest Control Advisors
Pesticide Applicators
Plant Managers
Agricultural Managers
Ranch Managers

² Other than occupational titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

Salaries

Exhibit 5 shows the “Market Salaries” for *Plant Health-related occupations*. These are calculated by Lightcast using a machine learning model built from millions of job postings every year. This accounts for adjustments based on location, industry, skills, experience, education, among other variables.

Exhibit 5. Market salaries

Market Salary	Job Postings
\$30,000-\$34,999	11
\$35,000-\$39,999	64
\$40,000-\$44,999	45
\$45,000-\$49,999	45
\$50,000-\$54,999	21
\$55,000-\$59,999	11
\$60,000-\$64,999	12
\$65,000-\$69,999	21
\$70,000-\$74,999	9
\$75,000+	109

Education

Of the 480 unique job postings, 320 listed a preferred or minimum educational requirement for the position being filled. Among those, 43% requested a high school diploma or GED (Exhibit 6).

Exhibit 6. Education levels requested in job postings

Education Level	Job Postings
High school or GED	138
Associate degree	62
Bachelor's degree	120

Baseline, Specialized, and Software Skills

Exhibit 7 shows the top baseline, specialized, and software skills in job postings. The most common baseline skill is communication. The most common specialized skill is pest control. The most common software skill is Microsoft Excel.

Exhibit 7. In-demand baseline, specialized, and software skills

Baseline Skills	Specialized Skills	Software Skills
Communication	Pest Control	Microsoft Excel
Management	Agriculture	Microsoft Outlook
Operations	Food Safety and Sanitation	Microsoft Office
Sales	Disease Prevention	Microsoft PowerPoint
Customer Service	Irrigation (Landscaping and Agriculture)	Microsoft Word

Education, Work Experience, & Training

A high school diploma or equivalent is typically required for all three occupations included in this report (Exhibit 8).

Exhibit 8. Education, work experience, and training for occupations related to *Plant Health*

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training
Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	5 years or more	None
Pest Control Workers	High school diploma or equivalent	None	Moderate-term on-the-job training
Pesticide Handlers, Sprayers, and Applicators, Vegetation	High school diploma or equivalent	None	Moderate-term on-the-job training

Supply

An analysis of program data from the California Community Colleges Chancellor's Office Datamart for the last three program years shows that, on average, 190 awards (community college) were conferred in the SCV/SML subregion (Exhibits 9, 10, and 11).

Exhibit 9. TOP and CIP codes relevant to *Plant Health*

TOP Titles	CIP Titles
0101.00 – Agriculture Technology and Sciences, General	
0103.00 – Plant Science	01.1105 - Plant Protection and Integrated Pest Management
0103.10 – Agricultural Pest Control Adviser and Operator (Licensed)	

Exhibit 10. Community College Awards in the CVML region

Exhibit For Community College Awards in the CVML Region						
TOP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
0101.00	Agriculture Technology and Sciences, General	Merced	12	6	6	8
		Modesto	12	22	13	16
		NCV/NML Subtotal	24	28	19	24
		Porterville	9	7	4	7
		Reedley College	1	2	3	2
		West Hills Coalinga	22	42	38	34
		SCV/SML Subtotal	32	51	45	43
Supply Subtotal/Average			56	79	64	66
0103.00	Plant Science	Merced	5	1	17	8
		Modesto	8	5	16	10
		San Joaquin Delta	-	1	1	1
		NCV/NML Subtotal	13	7	34	18
		Bakersfield	13	12	16	14
		Madera	-	3	4	2
		Reedley College	50	80	100	77
		Sequoias	10	11	17	13
		West Hills Coalinga	34	21	68	41
		SCV/SML Subtotal	107	127	205	146

TOP Code	Program	College	2020- 2021 Awards	2021- 2022 Awards	2022- 2023 Awards	3-Year Award Average
Supply Subtotal/Average			120	134	239	164
0103.10	Agricultural Pest Control Adviser and Operator (Licensed)	West Hills Coalinga	-	1	2	1
		SCV/SML Subtotal	-	1	2	1
Supply Subtotal/Average			-	1	2	1
Supply Total/Average			176	214	305	232

For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for the three occupations. Exhibit 11 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Code:

- Plant Protection and Integrated Pest Management (01.1105)

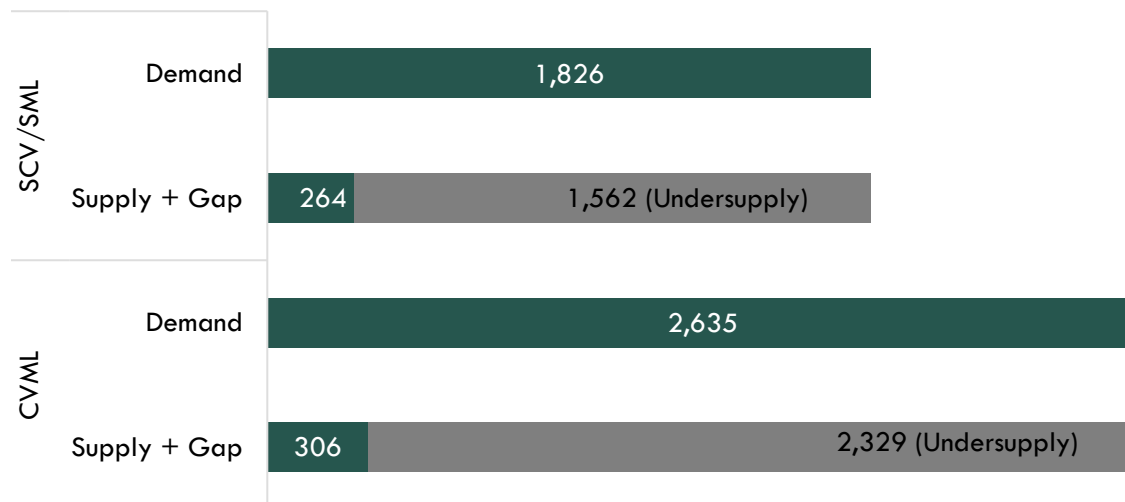
Due to different data collection periods, the most recent three-year period of available data is from 2019 to 2022. Between 2019 and 2022, non-community colleges in the region conferred an average of 74 awards annually in a related training program.

Exhibit 11. Non-Community College Awards in the CVML region

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
01.1105	Plant Protection and Integrated Pest Management	California State University-Fresno	74	76	71	74
Supply Total/Average			74	76	71	74

There is an undersupply of 1,562 workers in the SCV/SML subregion and an undersupply of 2,329 workers in the CVML region (Exhibit 12).

Exhibit 12. Workforce demand (annual job openings), postsecondary awards (supply), and additional students needed to fill gap in the SCV/SML subregion and CVML region



Recommendation

This report suggests there is a shortage of 1,562 workers in the SCV/SML subregion and a shortage of 2,329 workers in the CVML region for *Plant Health workers*. Based on these findings, it is recommended that College of the Sequoias work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of workers in the region.

Appendix: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor's Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (Lightcast). Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level Lightcast earnings by industry: economicmodeling.com.
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: https://www.bls.gov/emp/tables/educational-attainment.htm .
LaunchBoard	Chancellor's LaunchBoard. https://www.calpassplus.org/LaunchBoard/SWP.aspx
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov .
Job Posting and Skills Data	Burning Glass: burning-glass.com/ .
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: onetonline.org .

Key Terms and Concepts

Annual Job Openings: Annual openings are calculated by dividing the number of years in the projection period by total job openings.

Education Attainment Level: The highest education attainment level of workers age 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (LIGHTCAST) formula that includes historical employment and economic indicators along with national, state and local trends.

LaunchBoard (Attained the Living Wage): Among SWP students who exited college and did not transfer to any postsecondary institution, the proportion who attained the district county living wage for a single adult measured immediately following academic year of exit.

LaunchBoard (Median Annual Earnings): Among SWP students who exited the community college system and who did not transfer to any postsecondary institution, median earnings following the academic year of exit.

LaunchBoard (Median Change in Earnings): Among SWP students who exited and who did not transfer to any postsecondary institution, median change in earnings between the second quarter prior to the beginning of the academic year of entry and the second quarter after the end of the academic year of exit from the last college attended.

LaunchBoard (Job Closely Related to Field of Study): Among SWP students who responded to the CTE Outcomes Survey and did not transfer to any postsecondary institution, the proportion who reported that they are working in a job very closely or closely related to their field of study.

Living Wage: The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

Occupation: An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

Percent Change: Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

Replacements: Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

Total Job Openings (New + Replacements): Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

Typical Education Requirement: represents the typical education level most workers need to enter an occupation.

Typical On-The-Job Training: indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.