

May 2022

# Labor Market Analysis

## General Agriculture AS



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Prepared by the Central Valley/Mother Lode Center of Excellence

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**COVID-19 Statement:** This report includes employment projection data by Emsi. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

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# Summary

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for General Agriculture AS. Three occupations related to General Agriculture AS were identified for Merced College:

- 19-4011, Agricultural and Food Science Technicians
- 19-4099, Life, Physical, and Social Science Technicians, All Other
- 45-2011, Agricultural Inspectors

## Key findings:

- **Occupational demand** — Nearly 970 workers were employed in jobs related to General Agriculture AS in 2021 in the North Central Valley/Northern Mother Lode (NCV/NML) subregion. The largest occupation is agricultural and food science technicians with 652 workers, a projected growth rate of 1% over the next five years, and 89 annual openings.
- **Wages** — Life, physical, and social science technicians, all other earn the highest entry-level wage, \$17.83/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are Cepheid, Danaher Corporation, and Foster Farms.
- **Occupational titles** — The most common occupational title in job postings in the subregion is Quality Control Analysts. The most common job title is Quality Control Technician.
- **Skills and certifications** — The top baseline skill is communication skills, the top specialized skill is quality assurance and control, and the top software skill is Microsoft Excel. The most in-demand certification is a driver's license.
- **Education** — An associate degree is typically required for agricultural and food science technicians and life, physical, and social science technicians, all other. A bachelor's degree is typically required for agricultural inspectors.
- **Supply** — Analysis of postsecondary completions shows that on average 31 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 125 trained workers in the subregion and 338 workers in the region. The Center of Excellence recommends that Merced College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of General Agriculture AS workers in the region.

# Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Merced College to provide labor market information for General Agriculture AS. The geographical focus for this report is the North Central Valley/Northern Mother Lode (NCV/NML) subregion, but regional demand and supply data has been included for broader applicability and use. The average living wage for a single adult in the NCV/NML subregion is \$12.65/hour.<sup>1</sup> Analysis of the program and occupational data related to General Agriculture AS resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 19-4011, Agricultural and Food Science Technicians
- 19-4099, Life, Physical, and Social Science Technicians, All Other
- 45-2011, Agricultural Inspectors

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O\*NET OnLine are shown below. There was no O\*NET data available for agricultural and food science technicians and life, physical, and social science technicians, all other.

## Agricultural Inspectors

**Job Description:** Inspect agricultural commodities, processing equipment, and facilities, and fish and logging operations, to ensure compliance with regulations and laws governing health, quality, and safety.

**Knowledge:** Customer and Personal Service, Administration and Management, Administrative, Law and Government, Mathematics

**Skills:** Quality Control Analysis, Active Listening, Monitoring, Reading Comprehension, Critical Thinking

# Occupational Demand

The NCV/NML subregion employed 964 workers in General Agriculture AS occupations in 2021 (Exhibit 1). The largest occupation is agricultural and food science technicians with 652 workers. This occupation is projected to grow by 1% over the next five years and has the greatest number of projected annual openings, 89.

**Exhibit 1. General Agriculture AS employment and occupational projections in the NCV/NML subregion**

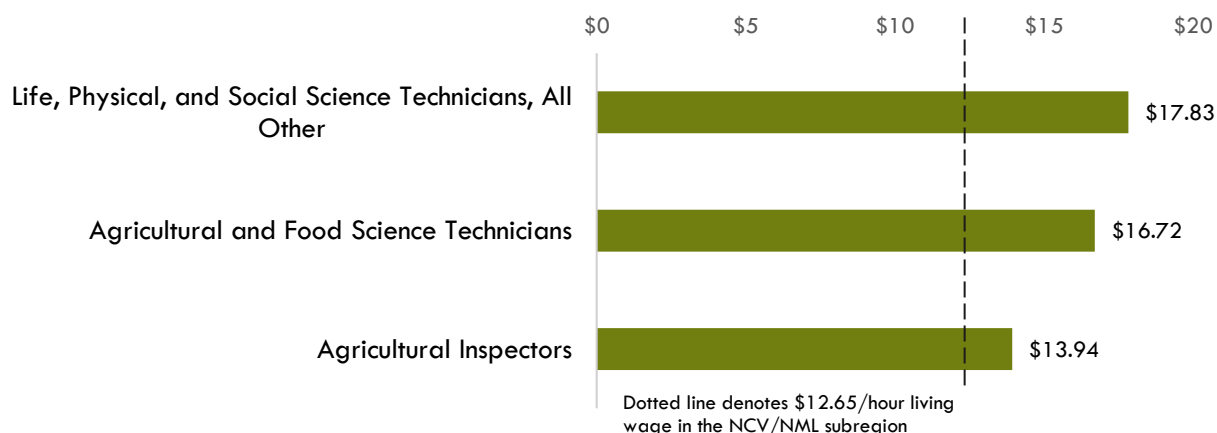
Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Agricultural and Food Science Technicians	652	661	9	1%	89
Agricultural Inspectors	178	182	4	2%	30
Life, Physical, and Social Science Technicians, All Other	134	151	17	13%	21
<b>TOTAL</b>	<b>964</b>	<b>993</b>	<b>30</b>	<b>3%</b>	<b>140</b>

<sup>1</sup> 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/>.

# Wages

Exhibit 2 shows the entry-level hourly wages of the General Agriculture AS occupations. Life, physical, and social science technicians, all other earn the highest entry-level wage, \$17.83/hour in the subregion<sup>2</sup>.

**Exhibit 2. General Agriculture AS entry-level wages in the NCV/NML subregion**



# Job Postings

There were 324 job postings for the three occupations in the NCV/NML subregion from November 2021 to April 2022.<sup>3</sup> The employers with the most job postings are listed in Exhibit 3.

**Exhibit 3. Top employers of General Agriculture AS by number of job postings**

Employer	Job Postings	% Job Postings
Cepheid	59	22%
Danaher Corporation	31	11%
Foster Farms	7	3%
Anthem Blue Cross	5	2%
Pacific Gas and Electric Company	5	2%
Sunopta	5	2%
Canopy Growth Corporation	3	1%
George Reed Incorporated	3	1%
Hm Clause	3	1%
Pinnacle Treatment Centers	3	1%

Exhibit 4 shows how job postings for the targeted occupations in the NCV/NML subregion are distributed across six O\*NET OnLine occupations. The occupational title Quality Control Analysts is listed in 282 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include Quality Control Technician in 36 job postings, Quality Assurance Technician in 32 job postings, and Quality Systems Specialist in 15 job postings.

<sup>2</sup> Entry-level wages are derived from the 25<sup>th</sup> percentile.

<sup>3</sup> Other than occupation 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.

**Exhibit 4. Top occupational titles in job postings for General Agriculture AS**

Occupational Title	Job Postings	% of Job Postings
Quality Control Analysts	282	87%
Agricultural Technicians	15	5%
Agricultural Inspectors	12	4%
Food Science Technicians	10	3%
Precision Agriculture Technicians	3	1%
Life, Physical, and Social Science Technicians, All Other	2	1%

**Salaries**

Exhibit 5 shows the “Market Salaries” for General Agriculture AS occupations. These are calculated by Burning Glass using a machine learning model built off of millions of job postings every year. This accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

**Exhibit 5. Salaries for General Agriculture AS occupations**

Market Salary Percentile	Salary Amount
10th Percentile	\$28,497
25th Percentile	\$31,048
50th Percentile	\$36,730
75th Percentile	\$47,540
90th Percentile	\$62,342

**Education**

Of the 324 job postings, 266 listed an education level preferred for the positions being filled. Among those, 70% requested high school or vocational training, 47% requested a bachelor’s degree, and 14% requested an associate degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

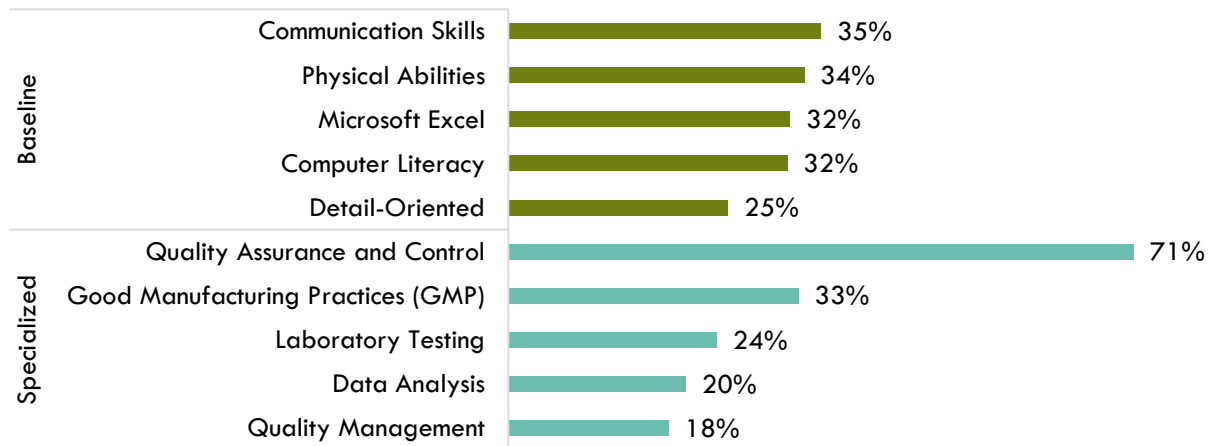
**Exhibit 6. Education levels requested in job postings for General Agriculture AS**

Education Level	Job Postings	% of Job Postings
High school or vocational training	185	70%
Bachelor's degree	126	47%
Associate's degree	37	14%
Master's degree	23	9%

**Baseline and Specialized Skills**

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication skills, 35% of job postings, physical abilities, 34%, and Microsoft Excel, 32%. The top three specialized skills are quality assurance and control, 71% of job postings, good manufacturing practices (GMP), 33%, and laboratory testing, 24%.

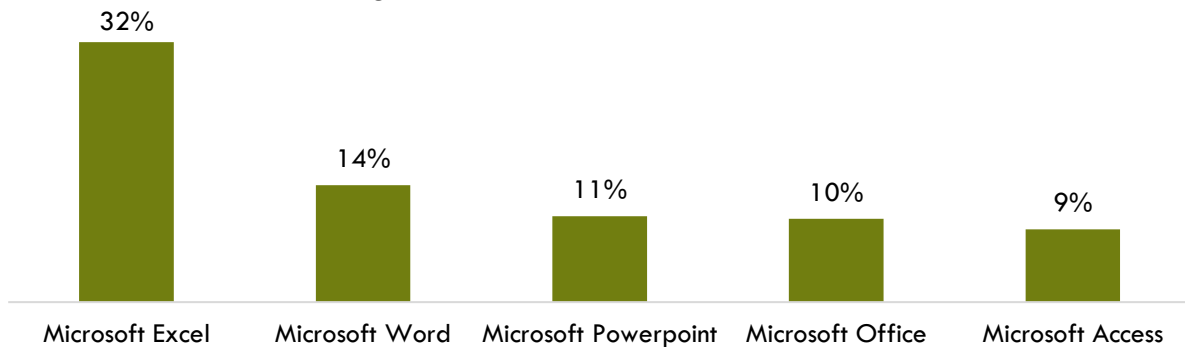
**Exhibit 7. In-demand General Agriculture AS baseline and specialized skills**



**Software Skills**

Analysis also included the software skills most in demand by employers. Microsoft Excel and Word were the top two software skills identified in job postings (Exhibit 8).

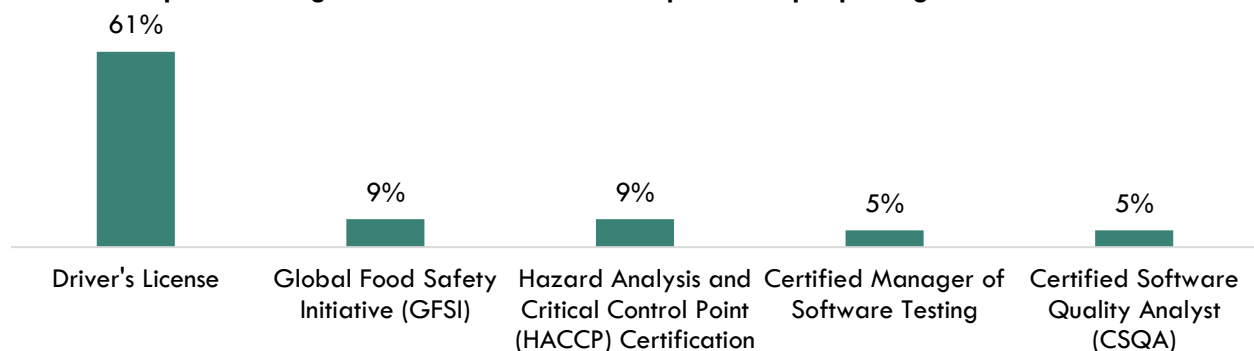
**Exhibit 8. In-demand General Agriculture AS software skills**



**Certifications**

Of the 324 job postings, 57 contained certification data. Among those, 61% indicated a need for a driver's license. The next top certifications are global food safety initiative (GFSI) and hazard analysis and critical control point (HACCP) certification (Exhibit 9). (Due to the low number of job postings with certifications listed, the chart below may not be representative of the full sample.)

**Exhibit 9. Top General Agriculture AS certifications requested in job postings**



# Education, Work Experience & Training

An associate degree is typically required for agricultural and food science technicians and life, physical, and social science technicians, all other. A bachelor's degree is typically required for agricultural inspectors (Exhibit 10).

**Exhibit 10. Education, work experience, training, and Current Population Survey results for General Agriculture AS occupations<sup>4</sup>**

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Agricultural and Food Science Technicians	Associate degree	None	Moderate-term	40.5%
Agricultural Inspectors	Bachelor's degree	None	Moderate-term	41.1%
Life, Physical, and Social Science Technicians, All Other	Associate degree	None	None	36.6%

## Supply

Analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) included the TOP and CIP codes and titles: 095650 - Welding Technology and 48.0508 - Welding Technology/Welder. Analysis of the last three years of data shows that, on average, 31 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

**Exhibit 11. Postsecondary supply for General Agriculture AS occupations in the region**

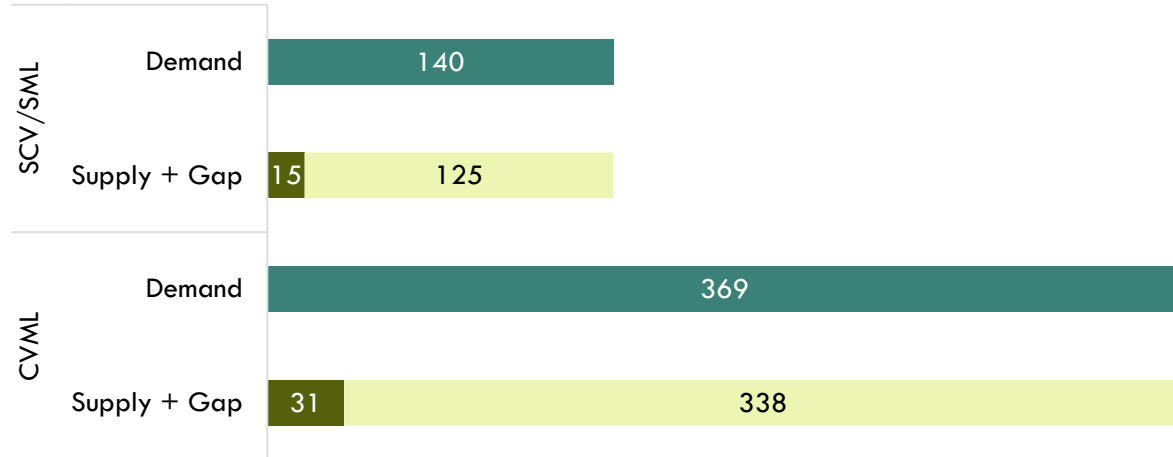
TOP/CIP Code- Title	College	Associate Degree	Certificate 18 < 30 Semester Units	Certificate 6 < 18 Semester Units	Certificate 8 < 16 Semester Units	Subtotal
010100 - Agriculture Technology and Sciences, General	Merced	9				9
	Modesto	6			0	6
	Porterville	9				9
	Reedley College	1	1			2
	West Hills Coalinga	2	1	1		4
<b>TOTAL</b>		<b>27</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>31</b>

<sup>4</sup> "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.



There is an undersupply of 125 General Agriculture AS workers in the NCV/NML subregion and 338 workers in the region (Exhibit 12).

**Exhibit 12. General Agriculture AS workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the NCV/NML subregion and region**



## Student Outcomes

Exhibit 13 summarizes employment and wage outcomes from the California Community College Chancellor’s Cal-PASS Plus LaunchBoard for the TOP code related to General Agriculture AS. Of note, 10 students received a degree or certificate or attained apprenticeship journey status; 49 students transferred; 57% of students obtained a job closely related to their field of study; 51% had a median change in earnings; and 52% of students attained a living wage.

**Exhibit 13. Subregional metrics for the TOP code related to General Agriculture AS**

Metric	Agriculture Technology and Sciences, General 010100
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	10
Number of Students Who Transferred	49
Job Closely Related to Field of Study	57%
Median Change in Earnings	51%
Attained a Living Wage	52%
* denotes data not available.	

## Conclusion

The entry-level wages of the three occupations exceed the NCV/NML subregion's average living wage. There were 324 job postings in the past six months for occupations related to General Agriculture AS in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication skills, and the top specialized skill is quality assurance and control.
- The top software skill is Microsoft Excel.
- The top certification is a driver's license.

There is an undersupply of trained workers, a shortage of 125 in the NCV/NML subregion and 338 in the region.

## Recommendation

Based on these findings, it is recommended that Merced College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of General Agriculture AS workers in the region.

# Appendix A: 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. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI 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 EMSI earnings by industry: <a href="http://economicmodeling.com">economicmodeling.com</a> .
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: <a href="https://www.bls.gov/emp/tables/educational-attainment.htm">https://www.bls.gov/emp/tables/educational-attainment.htm</a> .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: <a href="http://labormarketinfo.edd.ca.gov">labormarketinfo.edd.ca.gov</a> .
Job Posting and Skills Data	Burning Glass: <a href="http://burning-glass.com/">burning-glass.com/</a> .
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: <a href="http://onetonline.org">onetonline.org</a> .

## 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. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

**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.