

## Labor Market Analysis: 0103.00 – Plant Science

**Agricultural Entrepreneurship** – Associate of Science (A.S.) degree; Certificate requiring 16 to fewer than 30 semester units

Los Angeles Center of Excellence, June 2024

<b>Program Endorsement:</b>	<b>Endorsed: All Criteria Met</b> <input type="checkbox"/>	<b>Endorsed: Some Criteria Met</b> <input checked="" type="checkbox"/>	<b>Not Endorsed</b> <input type="checkbox"/>
<b>Program Endorsement Criteria</b>			
<b>Supply Gap:</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
<b>Living Wage: (Entry-Level, 25<sup>th</sup>)</b>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
<b>Education:</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
<b>Emerging Occupation(s)</b>			
	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	

### SUMMARY

This report analyzes whether local labor market demand is being met by community college programs aligned with the identified middle-skill occupations<sup>1</sup> or whether a shortage of workers exists. Labor market demand is measured by annual job openings while education supply is measured by the number of awards (degrees and certificates) conferred on average each year.

Based on the available data, there appears to be a supply gap for the four identified middle-skill occupations in the region. While entry-level wages are lower than the self-sufficiency standard wage in both Los Angeles and Orange counties, more than half of current workers in the field have completed an associate degree or less educational attainment.

**Recommendation:** Due to two of the three program endorsement criteria being met, the Los Angeles Center of Excellence for Labor Market Research (LA COE) endorses this proposed program.

### Key Findings

#### Supply Gap

- 372 annual job openings are projected in the region through 2027. This number is greater than the three-year average of 105 awards conferred by educational institutions in the region.

<sup>1</sup> Middle-skill occupations typically require some postsecondary education, but less than a bachelor’s degree. The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor’s degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

### **Living Wage**

- 87% of annual job openings for these middle-skill agricultural occupations have entry-level wages **below** Los Angeles County’s self-sufficiency standard hourly wage (\$18.10/hour).<sup>2</sup>

### **Educational Attainment**

- 80% of the annual job openings typically require a high school diploma or equivalent for middle-skill agricultural occupations in the LA/OC region.
- 22%-42% of workers in the field have completed some college or an associate degree, according to national educational attainment data, while 73%-88% have earned an associate degree or less education.

### **Community college supply**

- 8 community colleges issued awards related to agriculture in the greater LA/OC region.
- 105 awards (degrees and certificates) were conferred on average each year between 2020 and 2023.

### **Other postsecondary supply**

- No sub-baccalaureate awards were conferred in the past three years by other postsecondary institutions in the greater LA/OC region.

## **TARGET OCCUPATIONS**

LA COE prepared this report to provide regional labor market and postsecondary supply data related to four middle-skill occupations. [For full occupation descriptions, please see Appendix.](#)

- **Farmers, Ranchers, and Other Agricultural Managers (11-9013)**<sup>3</sup>
- **Agricultural Technicians (19-4012)**<sup>4</sup>
- **Pesticide Handlers, Sprayers, and Applications, Vegetation (37-3012)**<sup>5</sup>
- **First-Line Supervisors of Farming, Fishing, and Forestry Workers (45-1011)**<sup>6</sup>

## **OCCUPATIONAL DEMAND**

Exhibit 1 shows the five-year occupational demand projections for these middle-skill agricultural occupations. In the greater Los Angeles/Orange County region, the number of jobs related to these occupations is projected to decrease by 8% through 2027. However, there will be nearly 400 job openings per year through 2027 due to retirements and workers leaving the field. The majority of jobs in 2022 for these middle-skill agricultural occupations (73%) were located in Los Angeles County.

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<sup>2</sup> Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: <http://selfsufficiencystandard.org/california>.

<sup>3</sup> [Farmers, Ranchers, and Other Agricultural Managers \(bls.gov\)](#)

<sup>4</sup> [Agricultural and Food Science Technicians \(bls.gov\)](#)

<sup>5</sup> [Pesticide Handlers, Sprayers, and Applicators, Vegetation \(bls.gov\)](#)

<sup>6</sup> [First-Line Supervisors of Farming, Fishing, and Forestry Workers \(bls.gov\)](#)

**Exhibit 1: Current employment and occupational demand, Los Angeles and Orange counties<sup>7</sup>**

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	2,366	2,238	(128)	(5%)	273
Orange	867	736	(132)	(15%)	99
<b>Total</b>	<b>3,233</b>	<b>2,974</b>	<b>(259)</b>	<b>(8%)</b>	<b>372</b>

**Detailed Occupation Data**

Exhibit 2 displays the current employment and projected occupational demand for each of the target occupations in Los Angeles County. The percentage of workers aged 55+ and automation index is included in order visualize upcoming replacement demand for these occupations. Pesticide handlers, sprayers, and applicators, vegetation have a higher-than-average risk of automation, while agricultural technicians have a smaller share of older workers in the field. There is a smaller percentage of farmers, ranchers, and other agricultural managers working full-time compared to the average across all jobs, signaling that this occupation may lend itself to part-time employment.

**Exhibit 2: Current employment, projected occupational demand, percentage of workers aged 55+, Los Angeles County<sup>8</sup>**

Occupation	2022 Jobs	2027 Jobs	5-Yr % Change	Annual Openings	% Aged 55 and older*	Auto-mation Index **	% Full Time Workers ***
Farmers, Ranchers, and Other Agricultural Managers	1,277	1,213	(5%)	128	40%	93.5	63%
Agricultural Technicians	318	359	13%	54	25%	94.8	100%
Pesticide Handlers, Sprayers, and Applicators, Vegetation	314	264	(16%)	36	27%	126.2	N/A
First-Line Supervisors of Farming, Fishing, and Forestry Workers	457	402	(12%)	55	31%	96.0	86%
<b>Total</b>	<b>2,366</b>	<b>2,238</b>	<b>(5%)</b>	<b>273</b>	<b>-</b>	<b>-</b>	<b>-</b>

<sup>7</sup> Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

<sup>8</sup> Ibid.

\*The average percentage of workers aged 55 and older across all occupations in the greater LA/OC region is 27%. Agricultural technicians have a smaller share of older workers, which typically indicates fewer replacements needs to offset the amount of impending retirements.

\*\*The automation index captures an occupation’s risk of being affected by automation with a base of 100. An automation index greater than 100 indicates a higher-than average risk of automation; less than 100 indicates a lower-than-average risk.

\*\*\* Across all jobs in California, 81% of workers are employed full-time.

## WAGES

The labor market endorsement in this report considers the entry-level hourly wages for these middle-skill agricultural occupations in Los Angeles County as they relate to the county’s self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater Los Angeles/Orange County region.

### Los Angeles County

The majority, 87%, of annual openings for these middle-skill agricultural occupations have entry-level wages below the self-sufficiency standard wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$15.50 and \$20.21. (Exhibit 3).

One occupation has entry-level wages above the self-sufficiency standard wage:

- Pesticide handlers, sprayers, and applicators, vegetation, \$20.21

Experienced workers can expect to earn wages between \$27.00 and \$39.86, which are higher than the self-sufficiency standard.

#### Exhibit 3: Earnings for occupations in Los Angeles County

Occupation	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)	Median Annual Earnings*
Farmers, Ranchers, and Other Agricultural Managers	\$15.50	\$18.27	\$31.43	\$38,000
Agricultural Technicians	\$16.81	\$19.69	\$27.00	\$41,000
Pesticide Handlers, Sprayers, and Applicators, Vegetation	\$20.21	\$24.39	\$39.86	\$50,700
First-Line Supervisors of Farming, Fishing, and Forestry Workers	\$17.74	\$23.87	\$33.78	\$49,700

\*Rounded to the nearest \$100

### Orange County

All four occupations have entry-level wages below the self-sufficiency standard wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages are in a range between \$15.50 and \$19.84 (Exhibit 4). Experienced workers can expect to earn wages between \$25.61 and \$39.04, which are higher than the self-sufficiency standard.

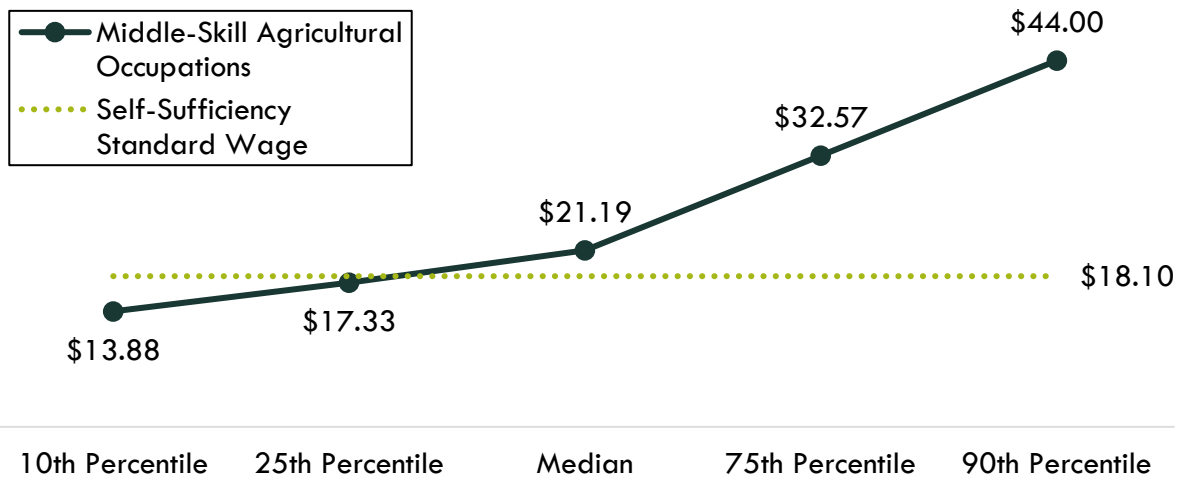
**Exhibit 4: Earnings for occupations in Orange County**

Occupation	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)	Median Annual Earnings*
Farmers, Ranchers, and Other Agricultural Managers	\$15.50	\$16.98	\$29.60	\$35,300
Agricultural Technicians	\$15.96	\$18.75	\$25.61	\$39,000
Pesticide Handlers, Sprayers, and Applicators, Vegetation	\$19.84	\$23.91	\$39.04	\$49,700
First-Line Supervisors of Farming, Fishing, and Forestry Workers	\$16.99	\$22.84	\$32.30	\$47,500

\*Rounded to the nearest \$100

Across the greater Los Angeles and Orange County region, the average entry-level hourly earnings for the occupations in this report are \$17.33; this is below the living wage for one single adult in Los Angeles County (\$18.10). Exhibit 5 shows the average hourly wage for the occupations in this report, for entry-level to experienced workers.

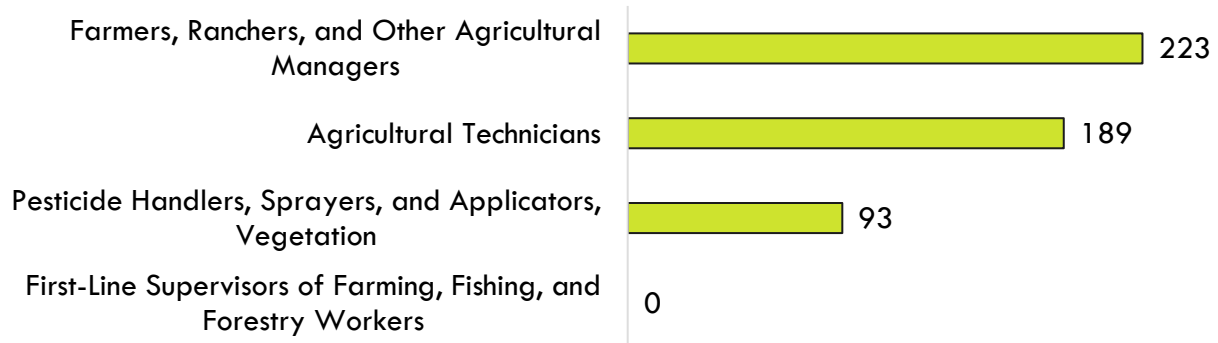
**Exhibit 5: Average hourly earnings for middle-skill agricultural occupations, Los Angeles and Orange counties**



**JOB POSTINGS**

There were 505 online middle-skill job postings related to agriculture listed in the past 12 months in Los Angeles and Orange counties. Exhibit 6 displays the number of job postings by occupation. The majority of job postings (44%) were for farmers, ranchers, and other agricultural managers, followed by agricultural technicians (37%) and pesticide handlers, sprayers, and applicators, vegetation (18%).

**Exhibit 6: Job postings by occupation (last 12 months), Los Angeles and Orange counties**



Job postings were analyzed for the most common job titles, skills, and employers associated with the target occupations in this report (Exhibit 7).

**Exhibit 7: Most commonly requested job titles, skills and employers in job postings, Los Angeles and Orange counties**

Top Job Titles	Top Skills	Top Employers
<ul style="list-style-type: none"> <li>• Spray technicians</li> <li>• Agricultural technicians</li> <li>• Horticulture technicians</li> <li>• Lawn Care specialists</li> <li>• Pesticide applicators</li> <li>• Farm managers</li> </ul>	<ul style="list-style-type: none"> <li>• Agriculture</li> <li>• Food safety &amp; sanitation</li> <li>• Warehousing</li> <li>• Irrigation (landscaping and agriculture)</li> <li>• Bilingual (Spanish/English)</li> </ul>	<ul style="list-style-type: none"> <li>• TruGreen</li> <li>• Brightview</li> <li>• California Public Utilities Commission</li> <li>• Stay Green</li> <li>• Landsystems Nursery</li> </ul>

In the greater Los Angeles/Orange County region, 39% of the middle-skill agricultural job postings listed a minimum educational requirement. The number and percentage of job postings by educational level appear in exhibit 8.

**Exhibit 8: Education levels requested in job postings for middle-skill agricultural occupations, Los Angeles and Orange counties**

Education Level	Job Postings	% of Job Postings
Bachelor's degree	92	47%
Associate degree	24	12%
High school diploma or vocational training	81	41%

**EDUCATIONAL ATTAINMENT**

In the greater Los Angeles/Orange County region, the majority of annual job openings (80%) typically require a high school diploma or equivalent (Exhibit 9). The national-level data indicates

between 22% and 42% of workers in the field have completed some college or an associate degree as their highest level of educational attainment, while between 73% and 88% have earned an associate degree or less educational attainment. The Bureau of Labor Statistics (BLS) lists the following typical entry-level education levels for the occupations in this report:

**Exhibit 9: Entry-level education preferred by employers nationally, Bureau of Labor Statistics**

Occupation	Education Level
Agricultural Technicians	Associate degree
Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent
Pesticide Handlers, Sprayers, and Applicators, Vegetation	High school diploma or equivalent
First-Line Supervisors of Farming, Fishing, and Forestry Workers	High school diploma or equivalent

## EDUCATIONAL SUPPLY

### Community College Supply

Exhibit 10 shows the annual and three-year average number of awards conferred by community colleges in programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are Saddleback, Mt. San Antonio, and Long Beach.

**Exhibit 10: Regional community college awards (certificates and degrees), 2020-2023**

TOP Code	Program	College	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Average
0101.00	Agriculture Technology and Sciences, General	Mt San Antonio	-	3	-	1
		<b>LA Subtotal</b>	<b>-</b>	<b>3</b>	<b>-</b>	<b>1</b>
<b>Supply Subtotal/Average</b>			<b>-</b>	<b>3</b>	<b>-</b>	<b>1</b>
0103.00	Plant Science	LA Pierce	-	2	2	1
		Mt San Antonio	5	9	12	9
		Pasadena	1	1	2	1
		<b>LA Subtotal</b>	<b>6</b>	<b>12</b>	<b>16</b>	<b>11</b>
<b>Supply Subtotal/Average</b>			<b>6</b>	<b>12</b>	<b>16</b>	<b>11</b>
0103.10	Agricultural Pest Control Adviser and Operator (Licensed)	Mt San Antonio	2	1	1	1
		<b>LA Subtotal</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Supply Subtotal/Average</b>			<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>
0109.00	Horticulture	El Camino	6	8	2	5

TOP Code	Program	College	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Average
		LA Pierce	3	1	5	3
		Long Beach	7	20	17	15
		Mt San Antonio	5	19	9	11
		<b>LA Subtotal</b>	<b>21</b>	<b>48</b>	<b>33</b>	<b>34</b>
		Fullerton	1	1	-	1
		Orange Coast	10	15	11	12
		Saddleback	47	40	28	38
		<b>OC Subtotal</b>	<b>58</b>	<b>56</b>	<b>39</b>	<b>51</b>
<b>Supply Subtotal/Average</b>			<b>79</b>	<b>104</b>	<b>72</b>	<b>85</b>
0109.30	Nursery Technology	Mt San Antonio	5	4	4	4
		<b>LA Subtotal</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>4</b>
		Fullerton	1	2	3	2
		<b>OC Subtotal</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>
<b>Supply Subtotal/Average</b>			<b>6</b>	<b>6</b>	<b>7</b>	<b>6</b>
<b>Supply Total/Average</b>			<b>93</b>	<b>126</b>	<b>96</b>	<b>105</b>

## Other Postsecondary Supply

Currently, there are no other postsecondary institutions in the greater LA/OC region that have conferred sub-baccalaureate awards for agricultural occupations in the past three years. However, over the past three years there have been bachelor's degrees conferred in these agriculture-focused CIP codes:

- 01.0102 – Agribusiness/Agricultural Business Operations
- 01.1105 – Plant Protection and Integrated Pest Management

## APPENDIX: OCCUPATION DESCRIPTIONS

LA COE prepared this report to provide regional labor market supply and demand data related to these target occupations:

- **Farmers, Ranchers, and Other Agricultural Managers (11-9013)** 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.<sup>9</sup>

<sup>9</sup> [Farmers, Ranchers, and Other Agricultural Managers \(bls.gov\)](https://www.bls.gov/occupations/11-9013)



- **Agricultural Technicians (19-4012)** Work with agricultural scientists in plant, fiber, and animal research, or assist with animal breeding and nutrition. Set up or maintain laboratory equipment and collect samples from crops or animals. Prepare specimens or record data to assist scientists in biology or related life science experiments. Conduct tests and experiments to improve yield and quality of crops or to increase the resistance of plants and animals to disease or insects.<sup>10</sup>
- **Pesticide Handlers, Sprayers, and Applications, Vegetation (37-3012)** 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.<sup>11</sup>
- **First-Line Supervisors of Farming, Fishing, and Forestry Workers (45-1011)** Directly supervise and coordinate the activities of agricultural, forestry, aquacultural, and related workers.<sup>12</sup>

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**DATA SOURCES**

- O\*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women's Welfare, University of Washington
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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<sup>10</sup> [Agricultural and Food Science Technicians \(bls.gov\)](https://www.bls.gov)

<sup>11</sup> [Pesticide Handlers, Sprayers, and Applicators, Vegetation \(bls.gov\)](https://www.bls.gov)

<sup>12</sup> [First-Line Supervisors of Farming, Fishing, and Forestry Workers \(bls.gov\)](https://www.bls.gov)