



# 2024 California Almond Objective Measurement Report



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## 2024 CALIFORNIA ALMOND FORECAST UP 13 PERCENT

The 2024 California almond production forecast is 2.80 billion meat pounds, down 7% from May's subjective forecast and 13% higher than last year's crop of 2.47 billion meat pounds. The forecast is based on 1.38 million bearing acres. Production for the Nonpareil variety is forecast at 1.10 billion meat pounds, 17% above last year's deliveries of 941 million meat pounds. The Nonpareil variety represents 39% of California's total almond production.

The 2024 almond crop experienced mostly favorable weather during the bloom period, which began the second week in February and finished by the middle of March. Bee hours were reported to be significantly higher than last year. Wet and warm weather in April increased pest and disease pressure, but dry conditions and mild temperatures in May helped the developing crop. Multiple heat waves across the state during June and July required growers to increase irrigation on their orchards. The almond harvest is expected to be on schedule.

The average nut set per tree is 4,072, an increase of 3% compared to 2023. The Nonpareil average nut set of 4,137 is 3% higher than last year. The average kernel weight for all varieties sampled was 1.61 grams, down 4% from the 2023 average weight. The Nonpareil average kernel weight was 1.64 grams, down 3% from the 2023 average weight. A total of 98.9% of all nuts sized were sound.

## SAMPLING PROCEDURES

To determine tree set, nuts are counted along two paths within each randomly selected tree. Work begins at the trunk and progresses to the end of the terminal branch. Using a random number table, one branch is selected at each forking to continue the path. A branch's probability of selection is directly proportional to its cross-sectional area. This methodology is used because of its statistical efficiency. The method also makes it possible to end up at any one of the tree's numerous terminal branches. This process is done twice.

Since each path has a probability of selection associated with it, this probability is used to expand nut counts and arrive at an estimated set for the entire tree.

Along intermediate stages (i.e., the bearing surface between forkings), every fifth nut is picked. All nuts on the terminal branch are picked. These nuts are used to determine size and weight measurements.

## FIELD SAMPLING ACTIVITIES

The survey began May 25 and sampling was completed by June 28. There were 1,904 trees sampled for the 2024 survey in 952 orchards. Data was collected from two random paths within each tree. Additional orchards were not sampled for one of the following reasons:

- 1) Orchard had been sprayed.
- 2) Orchard had been recently irrigated and was wet.
- 3) Orchard had been pulled.
- 4) Grower would not grant permission or could not be contacted.

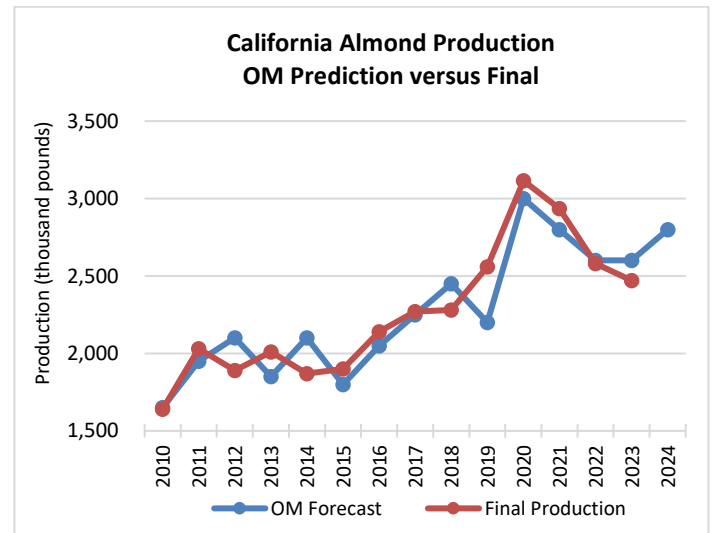
The Objective Measurement Survey is funded by the Almond Board of California.

TABLE 1: OBJECTIVE MEASUREMENT SURVEY COUNTS; COMPARISON OF NUT ESTIMATES AND ORCHARDS SAMPLED BY COUNTY AND VARIETY, 2023-2024

| County and Variety | 2023          |                  | 2024          |                  |
|--------------------|---------------|------------------|---------------|------------------|
|                    | Nuts per tree | Orchards sampled | Nuts per tree | Orchards sampled |
| <b>STATE LEVEL</b> | 3,953         | 912              | 4,072         | 952              |
| <b>BY COUNTY</b>   |               |                  |               |                  |
| Colusa             | 4,336         | 39               | 4,231         | 43               |
| Fresno             | 2,946         | 171              | 3,317         | 187              |
| Kern               | 4,374         | 158              | 3,718         | 176              |
| Madera             | 3,001         | 114              | 4,996         | 116              |
| Merced             | 4,686         | 138              | 5,429         | 138              |
| San Joaquin        | 3,196         | 39               | 3,860         | 39               |
| Stanislaus         | 4,260         | 148              | 3,258         | 149              |
| Tulare             | 4,677         | 38               | 4,493         | 41               |
| Other <sup>1</sup> | 4,771         | 67               | 4,295         | 63               |
| <b>BY VARIETY</b>  |               |                  |               |                  |
| Butte              | 4,043         | 54               | 3,316         | 56               |
| Carmel             | 4,959         | 39               | 5,356         | 33               |
| Independence       | 4,048         | 91               | 3,448         | 111              |
| Monterey           | 3,598         | 178              | 4,257         | 199              |
| Nonpareil          | 4,004         | 376              | 4,137         | 361              |
| Padre              | 4,055         | 40               | 3,953         | 46               |
| Other <sup>2</sup> | 3,856         | 134              | 4,170         | 146              |

<sup>1</sup> Other includes: Butte, Glenn, Kings, Solano, Sutter, Tehama, and Yolo.

<sup>2</sup> Other includes: Aldrich, Avalon, Bennett-Hickman, Fritz, Price Cluster, Shasta, Sonora, Supareil, Winters, and Wood Colony.



## DATA RELIABILITY

The 80% confidence interval is from 2,430,000 to 3,170,000 meat pounds.

**TABLE 2: WEIGHT, SIZE AND GRADE OF AVERAGE ALMOND SAMPLE, 2023-2024**

| District and variety      | Kernel weight (grams) | Kernel size (millimeters) |       |           | Grade (percent of nuts) <sup>1</sup> |         |               |              |              |              |              |  |
|---------------------------|-----------------------|---------------------------|-------|-----------|--------------------------------------|---------|---------------|--------------|--------------|--------------|--------------|--|
|                           |                       |                           |       |           | Edible nuts                          |         | Insect damage | Shrivel      | Natural gum  | Blank        | Other        |  |
|                           |                       | Length                    | Width | Thickness | Singles                              | Doubles |               |              |              |              |              |  |
| <b><u>STATE LEVEL</u></b> |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.67                  | 23.90                     | 13.15 | 9.92      | 90.6                                 | 7.8     | <sup>2</sup>  | 1.4          | 0.1          | <sup>2</sup> | 0.1          |  |
| 2024                      | 1.61                  | 22.81                     | 13.18 | 10.27     | 96.0                                 | 2.8     | <sup>2</sup>  | 1.0          | 0.1          | <sup>2</sup> | <sup>2</sup> |  |
| <b><u>BY COUNTY</u></b>   |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| Colusa                    |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.58                  | 22.78                     | 13.70 | 9.80      | 92.9                                 | 6.0     | <sup>2</sup>  | 1.0          | <sup>2</sup> | 0.1          | <sup>2</sup> |  |
| 2024                      | 1.48                  | 22.14                     | 13.13 | 10.04     | 93.3                                 | 5.7     | 0.1           | 0.7          | <sup>2</sup> | <sup>2</sup> | 0.2          |  |
| Fresno                    |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.60                  | 23.56                     | 12.97 | 9.77      | 92.7                                 | 5.9     | <sup>2</sup>  | 1.3          | <sup>2</sup> | <sup>2</sup> | 0.1          |  |
| 2024                      | 1.53                  | 22.34                     | 13.05 | 10.20     | 96.7                                 | 2.1     | <sup>2</sup>  | 1.0          | <sup>2</sup> | <sup>2</sup> | 0.1          |  |
| Kern                      |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.59                  | 23.43                     | 12.59 | 9.76      | 93.0                                 | 6.3     | <sup>2</sup>  | 0.6          | <sup>2</sup> | 0.1          | <sup>2</sup> |  |
| 2024                      | 1.55                  | 22.20                     | 12.50 | 10.16     | 97.0                                 | 1.8     | <sup>2</sup>  | 1.0          | 0.1          | <sup>2</sup> | 0.1          |  |
| Madera                    |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.78                  | 25.17                     | 13.82 | 10.21     | 89.8                                 | 10.2    | <sup>2</sup>  | <sup>2</sup> | <sup>2</sup> | <sup>2</sup> | <sup>2</sup> |  |
| 2024                      | 1.61                  | 23.00                     | 13.42 | 10.30     | 96.6                                 | 3.4     | <sup>2</sup>  | <sup>2</sup> | <sup>2</sup> | <sup>2</sup> | <sup>2</sup> |  |
| Merced                    |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.69                  | 23.83                     | 12.88 | 10.00     | 88.3                                 | 9.6     | <sup>2</sup>  | 2.0          | 0.1          | <sup>2</sup> | <sup>2</sup> |  |
| 2024                      | 1.64                  | 22.48                     | 13.19 | 10.20     | 96.9                                 | 2.8     | <sup>2</sup>  | 0.2          | <sup>2</sup> | <sup>2</sup> | <sup>2</sup> |  |
| San Joaquin               |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.99                  | 24.70                     | 13.99 | 10.33     | 87.3                                 | 7.0     | <sup>2</sup>  | 4.4          | 1.2          | <sup>2</sup> | <sup>2</sup> |  |
| 2024                      | 1.76                  | 23.90                     | 13.50 | 10.57     | 93.5                                 | 2.3     | <sup>2</sup>  | 3.3          | 0.9          | <sup>2</sup> | <sup>2</sup> |  |
| Stanislaus                |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.70                  | 23.85                     | 13.09 | 9.99      | 89.0                                 | 9.1     | <sup>2</sup>  | 1.5          | 0.4          | <sup>2</sup> | 0.1          |  |
| 2024                      | 1.73                  | 23.40                     | 13.32 | 10.60     | 94.5                                 | 2.7     | <sup>2</sup>  | 2.5          | 0.3          | <sup>2</sup> | <sup>2</sup> |  |
| Tulare                    |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.67                  | 24.76                     | 13.44 | 9.88      | 88.3                                 | 8.7     | 0.4           | 1.6          | <sup>2</sup> | <sup>2</sup> | 1.0          |  |
| 2024                      | 1.63                  | 23.76                     | 13.60 | 10.50     | 95.8                                 | 2.7     | <sup>2</sup>  | 1.4          | <sup>2</sup> | <sup>2</sup> | 0.1          |  |
| Other <sup>3</sup>        |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.68                  | 23.94                     | 13.73 | 9.71      | 92.7                                 | 5.2     | <sup>2</sup>  | 2.0          | <sup>2</sup> | <sup>2</sup> | <sup>2</sup> |  |
| 2024                      | 1.70                  | 23.96                     | 13.96 | 10.13     | 94.7                                 | 4.4     | <sup>2</sup>  | 0.9          | <sup>2</sup> | 0.1          | <sup>2</sup> |  |
| <b><u>BY VARIETY</u></b>  |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| Butte                     |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.36                  | 20.33                     | 12.16 | 9.99      | 89.0                                 | 9.8     | <sup>2</sup>  | 0.8          | 0.2          | 0.2          | <sup>2</sup> |  |
| 2024                      | 1.38                  | 19.93                     | 12.52 | 10.34     | 97.3                                 | 1.7     | <sup>2</sup>  | 0.9          | 0.1          | 0.1          | <sup>2</sup> |  |
| Carmel                    |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.72                  | 25.31                     | 12.41 | 10.13     | 83.0                                 | 15.2    | <sup>2</sup>  | 1.7          | 0.1          | <sup>2</sup> | <sup>2</sup> |  |
| 2024                      | 1.54                  | 22.53                     | 12.51 | 10.25     | 96.4                                 | 2.9     | <sup>2</sup>  | 0.7          | 0.1          | <sup>2</sup> | <sup>2</sup> |  |
| Independence              |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.88                  | 25.32                     | 13.93 | 10.05     | 93.3                                 | 4.6     | <sup>2</sup>  | 1.6          | 0.3          | <sup>2</sup> | 0.2          |  |
| 2024                      | 1.88                  | 24.38                     | 14.45 | 10.65     | 96.0                                 | 2.6     | <sup>2</sup>  | 1.3          | 0.1          | <sup>2</sup> | <sup>2</sup> |  |
| Monterey                  |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.82                  | 25.75                     | 12.95 | 10.25     | 81.0                                 | 17.9    | <sup>2</sup>  | 0.8          | 0.2          | <sup>2</sup> | <sup>2</sup> |  |
| 2024                      | 1.68                  | 23.96                     | 13.00 | 10.37     | 93.5                                 | 5.7     | <sup>2</sup>  | 0.6          | 0.1          | <sup>2</sup> | <sup>2</sup> |  |
| Nonpareil                 |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.69                  | 23.85                     | 13.59 | 9.78      | 94.0                                 | 4.0     | <sup>2</sup>  | 1.8          | 0.1          | <sup>2</sup> | 0.1          |  |
| 2024                      | 1.64                  | 22.91                     | 13.45 | 10.18     | 97.1                                 | 1.7     | <sup>2</sup>  | 1.2          | 0.1          | <sup>2</sup> | <sup>2</sup> |  |
| Padre                     |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.21                  | 19.66                     | 11.73 | 9.56      | 95.8                                 | 2.7     | <sup>2</sup>  | 1.5          | <sup>2</sup> | <sup>2</sup> | <sup>2</sup> |  |
| 2024                      | 1.33                  | 19.64                     | 12.53 | 10.29     | 98.4                                 | 0.8     | <sup>2</sup>  | 0.8          | 0.1          | <sup>2</sup> | <sup>2</sup> |  |
| Other <sup>4</sup>        |                       |                           |       |           |                                      |         |               |              |              |              |              |  |
| 2023                      | 1.54                  | 23.00                     | 12.66 | 9.80      | 93.0                                 | 6.0     | <sup>2</sup>  | 0.8          | 0.2          | <sup>2</sup> | <sup>2</sup> |  |
| 2024                      | 1.49                  | 21.92                     | 12.62 | 10.11     | 96.0                                 | 2.7     | <sup>2</sup>  | 0.9          | 0.2          | <sup>2</sup> | 0.2          |  |

<sup>1</sup> Percentages may not add to 100 due to rounding.

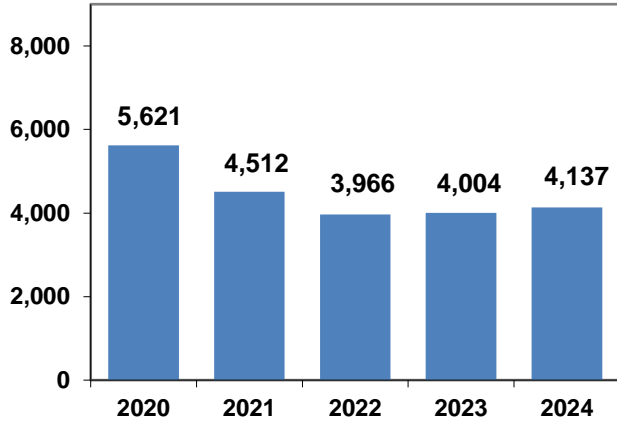
<sup>2</sup> Not shown if less than 0.05 percent.

<sup>3</sup> Other includes: Butte, Glenn, Kings, Solano, Sutter, Tehama, and Yolo.

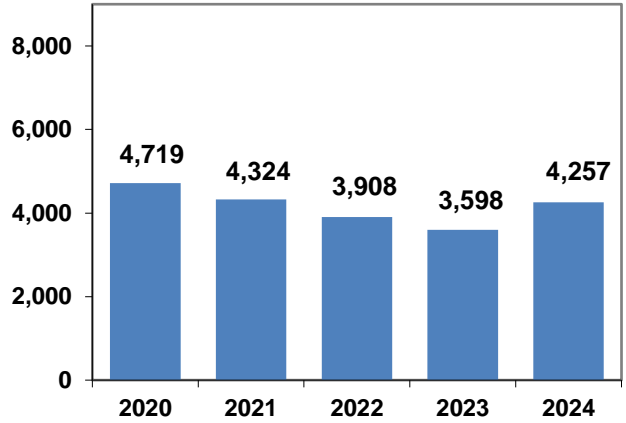
<sup>4</sup> Other includes: Aldrich, Avalon, Bennett-Hickman, Fritz, Price Cluster, Shasta, Sonora, Supareil, Winters, and Wood Colony.

## ALMONDS NUT SET BY VARIETY

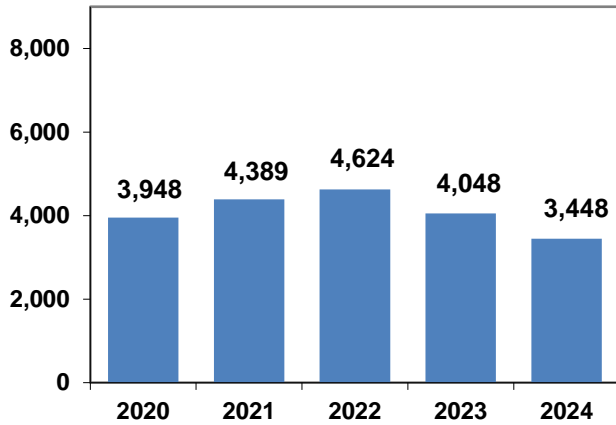
**NONPAREIL TYPE**  
Nuts per Tree



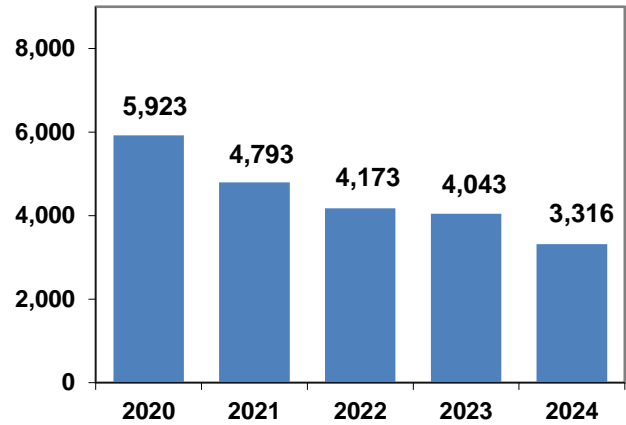
**MONTEREY TYPE**  
Nuts per Tree



**INDEPENDENCE TYPE**  
Nuts per Tree

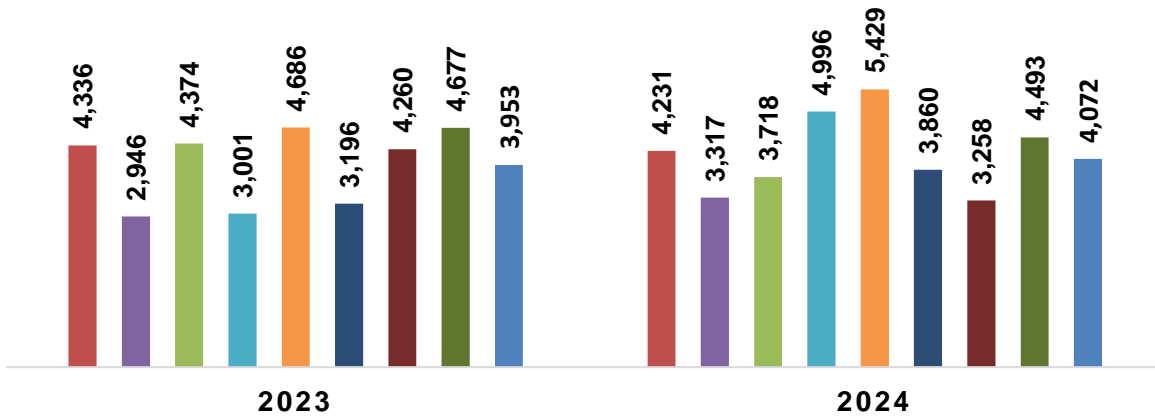


**BUTTE TYPE**  
Nuts per Tree



## ALMONDS NUTS PER TREE, BY COUNTY & STATE

■ Colusa   
 ■ Fresno   
 ■ Kern   
 ■ Madera   
 ■ Merced   
 ■ San Joaquin   
 ■ Stanislaus   
 ■ Tulare   
 ■ State



**TABLE 3: CALIFORNIA ALMOND ACREAGE, PRODUCTION AND TREES PER ACRE, 1995-2024**

| Year                | Bearing acres <sup>1</sup> | Trees per acre | Total Meat Production    |              |               | Price per lb. | Value of production |
|---------------------|----------------------------|----------------|--------------------------|--------------|---------------|---------------|---------------------|
|                     |                            |                | Metric Tons <sup>2</sup> | Million lbs. | Lbs. per acre | dollars       | 1,000 dollars       |
| 1995                | 418,000                    | 93.7           | 168,000                  | 370          | 890           | 2.48          | 880,896             |
| 1996                | 428,000                    | 94.4           | 231,000                  | 510          | 1,190         | 2.08          | 1,018,368           |
| 1997                | 442,000                    | 95.5           | 344,000                  | 759          | 1,720         | 1.56          | 1,160,640           |
| 1998                | 460,000                    | 96.3           | 236,000                  | 520          | 1,130         | 1.41          | 703,590             |
| 1999                | 485,000                    | 97.3           | 378,000                  | 833          | 1,720         | 0.86          | 687,742             |
| 2000                | 510,000                    | 99.0           | 319,000                  | 703          | 1,380         | 0.97          | 666,487             |
| 2001                | 530,000                    | 101.0          | 376,000                  | 830          | 1,570         | 0.91          | 740,012             |
| 2002                | 545,000                    | 101.0          | 494,000                  | 1,090        | 2,000         | 1.11          | 1,200,687           |
| 2003                | 550,000                    | 103.0          | 472,000                  | 1,040        | 1,890         | 1.57          | 1,600,144           |
| 2004                | 570,000                    | 103.0          | 456,000                  | 1,005        | 1,760         | 2.21          | 2,189,005           |
| 2005                | 590,000                    | 104.0          | 415,000                  | 915          | 1,550         | 2.81          | 2,525,909           |
| 2006                | 610,000                    | 105.0          | 508,000                  | 1,120        | 1,840         | 2.06          | 2,258,790           |
| 2007                | 640,000                    | 105.0          | 630,000                  | 1,390        | 2,170         | 1.75          | 2,401,875           |
| 2008                | 710,000                    | 107.0          | 739,000                  | 1,630        | 2,300         | 1.45          | 2,343,200           |
| 2009                | 750,000                    | 108.0          | 640,000                  | 1,410        | 1,880         | 1.65          | 2,293,500           |
| 2010                | 770,000                    | 108.0          | 744,000                  | 1,640        | 2,130         | 1.79          | 2,903,380           |
| 2011                | 800,000                    | 111.0          | 921,000                  | 2,030        | 2,540         | 1.99          | 4,007,860           |
| 2012                | 820,000                    | 112.0          | 857,000                  | 1,890        | 2,300         | 2.58          | 4,816,860           |
| 2013                | 880,000                    | 112.0          | 912,000                  | 2,010        | 2,280         | 3.21          | 6,384,690           |
| 2014                | 930,000                    | 114.0          | 848,000                  | 1,870        | 2,010         | 4.00          | 7,388,000           |
| 2015                | 950,000                    | 114.0          | 862,000                  | 1,900        | 2,000         | 3.13          | 5,868,750           |
| 2016                | 970,000                    | 116.0          | 971,000                  | 2,140        | 2,210         | 2.39          | 5,052,460           |
| 2017                | 1,030,000                  | 117.0          | 1,030,000                | 2,270        | 2,200         | 2.53          | 5,603,950           |
| 2018                | 1,090,000                  | 119.0          | 1,034,000                | 2,280        | 2,090         | 2.50          | 5,602,500           |
| 2019                | 1,180,000                  | 122.0          | 1,161,000                | 2,560        | 2,170         | 2.45          | 6,169,100           |
| 2020                | 1,250,000                  | 122.0          | 1,413,000                | 3,115        | 2,490         | 1.71          | 5,251,410           |
| 2021                | 1,310,000                  | 122.0          | 1,331,000                | 2,935        | 2,240         | 1.86          | 5,351,220           |
| 2022                | 1,350,000                  | 122.5          | 1,170,000                | 2,580        | 1,910         | 1.40          | 3,536,400           |
| 2023                | 1,380,000                  | 124.7          | 1,120,000                | 2,470        | 1,790         | 1.64          | 3,880,240           |
| 2024 <sup>3 4</sup> | 1,380,000                  | 125.4          | 1,270,000                | 2,800        | 2,030         | —             | —                   |

<sup>1</sup> Bearing acreage is defined as plantings four years and older.<sup>2</sup> Rounded to nearest thousand, metric ton = 2,204.62 pounds.<sup>3</sup> Price and value will be available in the annual Noncitrus Fruits & Nuts publication, released in May 2025.<sup>4</sup> Preliminary estimate of bearing acres. [Land IQ almond acreage, age, and removals mapping data were consulted.](#)**TABLE 4: 2024 ALMOND OM SAMPLE DISTRIBUTION BY COUNTY AND VARIETY**

|              | Butte     | Carmel    | Independence | Monterey   | Nonpareil  | Padre     | Other <sup>1</sup> | Total      |
|--------------|-----------|-----------|--------------|------------|------------|-----------|--------------------|------------|
| Butte        | 0         | 0         | 1            | 1          | 10         | 0         | 0                  | 12         |
| Colusa       | 4         | 1         | 0            | 6          | 24         | 1         | 7                  | 43         |
| Fresno       | 10        | 0         | 30           | 43         | 61         | 10        | 33                 | 187        |
| Glenn        | 1         | 0         | 0            | 0          | 20         | 0         | 0                  | 21         |
| Kern         | 15        | 1         | 9            | 48         | 64         | 8         | 31                 | 176        |
| Kings        | 0         | 0         | 3            | 5          | 4          | 0         | 0                  | 12         |
| Madera       | 5         | 1         | 9            | 33         | 42         | 8         | 18                 | 116        |
| Merced       | 11        | 11        | 18           | 26         | 40         | 11        | 21                 | 138        |
| San Joaquin  | 2         | 2         | 9            | 0          | 22         | 1         | 3                  | 39         |
| Solano       | 0         | 0         | 2            | 0          | 1          | 0         | 0                  | 3          |
| Stanislaus   | 7         | 17        | 22           | 20         | 46         | 7         | 30                 | 149        |
| Sutter       | 0         | 0         | 1            | 0          | 0          | 0         | 0                  | 1          |
| Tehama       | 0         | 0         | 0            | 0          | 2          | 0         | 0                  | 2          |
| Tulare       | 1         | 0         | 6            | 15         | 18         | 0         | 1                  | 41         |
| Yolo         | 0         | 0         | 1            | 2          | 7          | 0         | 2                  | 12         |
| <b>Total</b> | <b>56</b> | <b>33</b> | <b>111</b>   | <b>199</b> | <b>361</b> | <b>46</b> | <b>146</b>         | <b>952</b> |

<sup>1</sup> Other includes Aldrich, Avalon, Bennett-Hickman, Fritz, Price Cluster, Shasta, Sonora, Supareil, Winters, and Wood Colony.