2021 Almond Objective Measurement Survey Results

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Survey Methodology

- Random selection of orchards based on location, variety and age

- Randomly select two trees in each selected orchard

- Second year for two count units per tree

- Random Path Method used to locate count units

- Sample of nuts taken and sent to sizing station

- Measured kernel weight, length, width, thickness and grade

Data Collection

- Field Work: May 26 – June 30

- Use 50+ Enumerators

- Increased sample size to 1,048 orchards
  - Collected data from 914 orchards

Thank you to the growers that let us work in their orchards.

Thank you to those that encouraged growers to participate.

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Forecast Models

- Models are designed to produce a forecast of all almond production at the state level from the sample data.

- Models do not forecast production by variety. Separate models are run for Nonpareil since there are a significant number of samples.
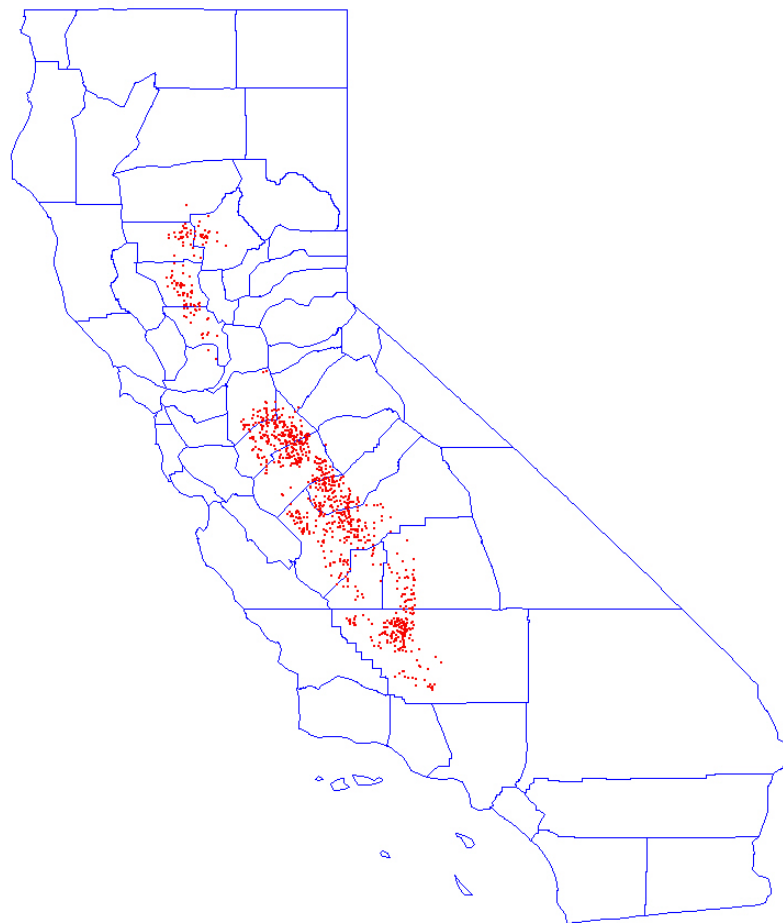
Forecast Models

- Models use:
  - official estimates of bearing acres and trees per acre
  - OM measurements of:
    - nuts per tree
    - percent sound
    - weight
    - width
    - thickness
    - length
- Model output is regressed against final production using previous 15 years.

Distribution of Samples

Lack of water issues

- Orchards where immature nuts have been removed.
  - Sampled trees in these orchards were summarize with zero nut set.

- Pulled orchards
  - We compared the number of sampled orchards that were pulled for this year with 2020 and 2019.
  - No substantial difference with more pulled samples in 2020 than 2021.
  - Therefore we didn't change our estimate of bearing acres for this forecast.

Top Soil Moisture Map
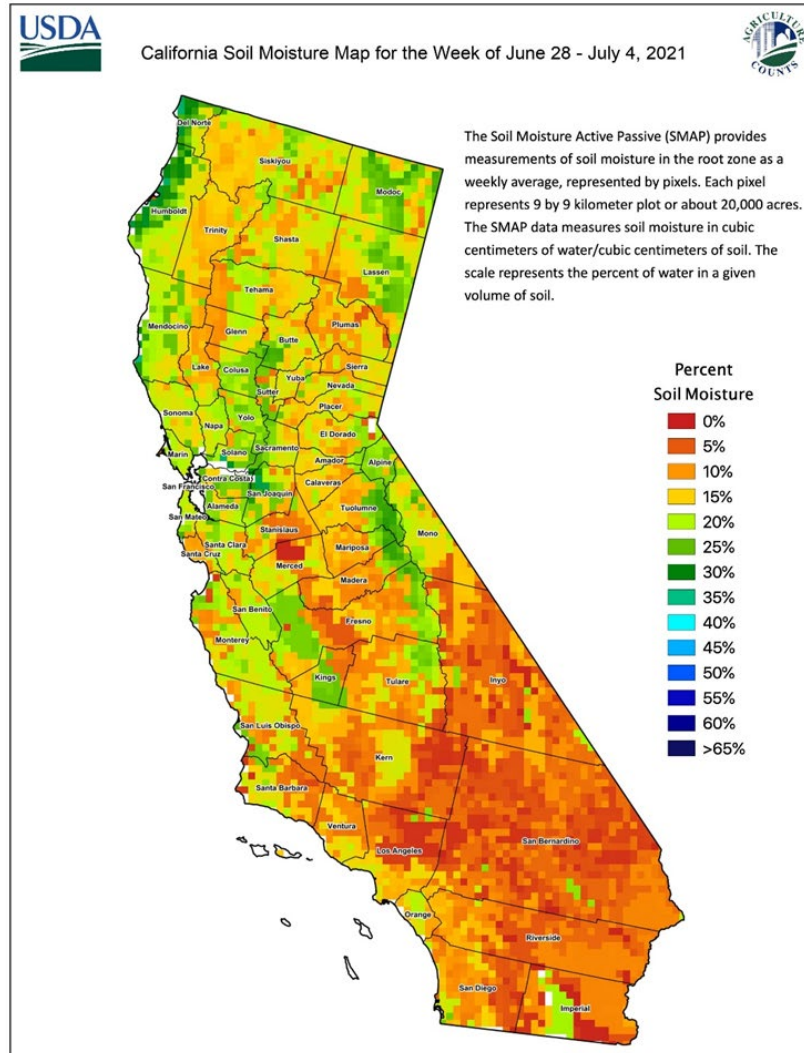
And the 2021 Production forecast is……

- **Highlights**
  - **Production forecasted at 2.8 billion meat pounds**
  - **Down 10% from the 2020 production**
  - **1.33 million bearing acres, increase of 80,000 acres**
  - **Yield calculates to 2,110 pounds/acre, down 15% from last year**

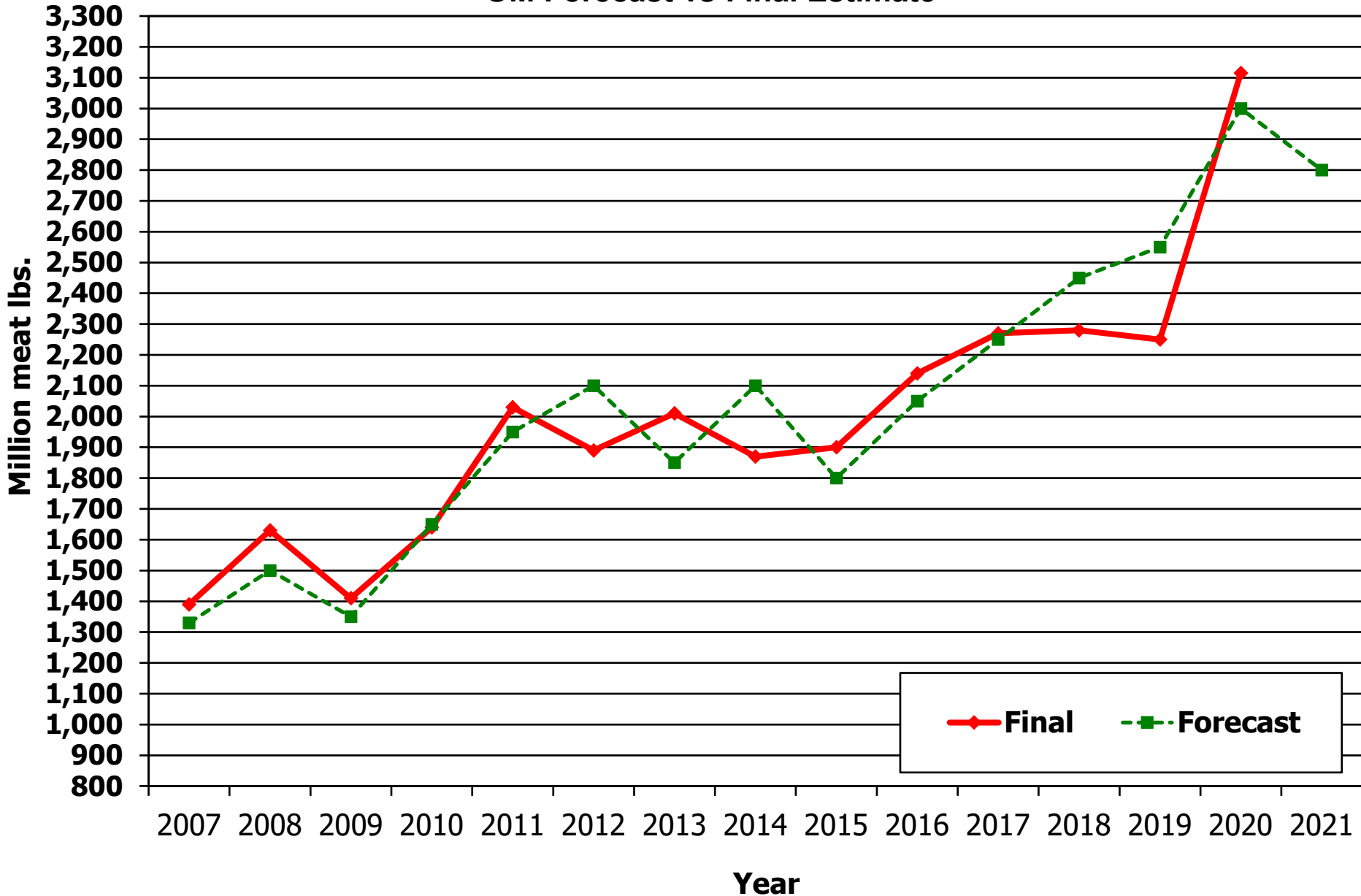- **Highlights – Nonpareil Variety**
  - **Production from Nonpareil variety is forecasted at 1.1 billion meat pounds**
  - **Down 15% from the 2020 production**
  - **39% of total production**

ALMOND PRODUCTION - CALIFORNIA
OM Forecast vs Final Estimate

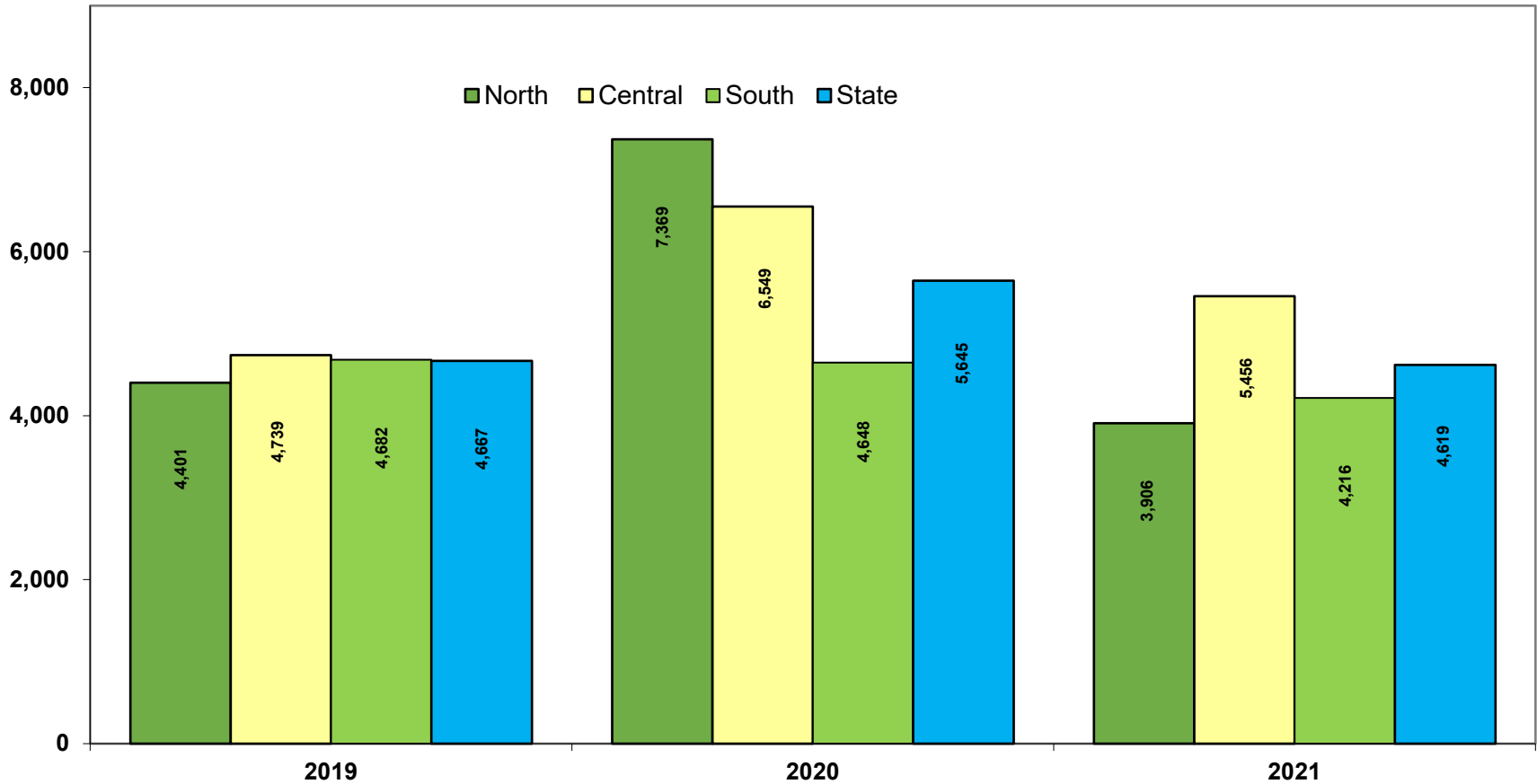# 2021 Almond Objective Measurement Survey Results

Almond Set 2019 – 2021
Average nuts per tree

	2019	2020	2021	% Change
California	4,667	5,645	4,619	-18.2

ALMONDS
Nuts per Tree, by Region

Legend: ■ North □ Central ■ South ■ State

2019
- North: 4,401
- Central: 4,739
- South: 4,682
- State: 4,667

2020
- North: 7,369
- Central: 6,549
- South: 4,648
- State: 5,645

2021
- North: 3,906
- Central: 5,456
- South: 4,216
- State: 4,619

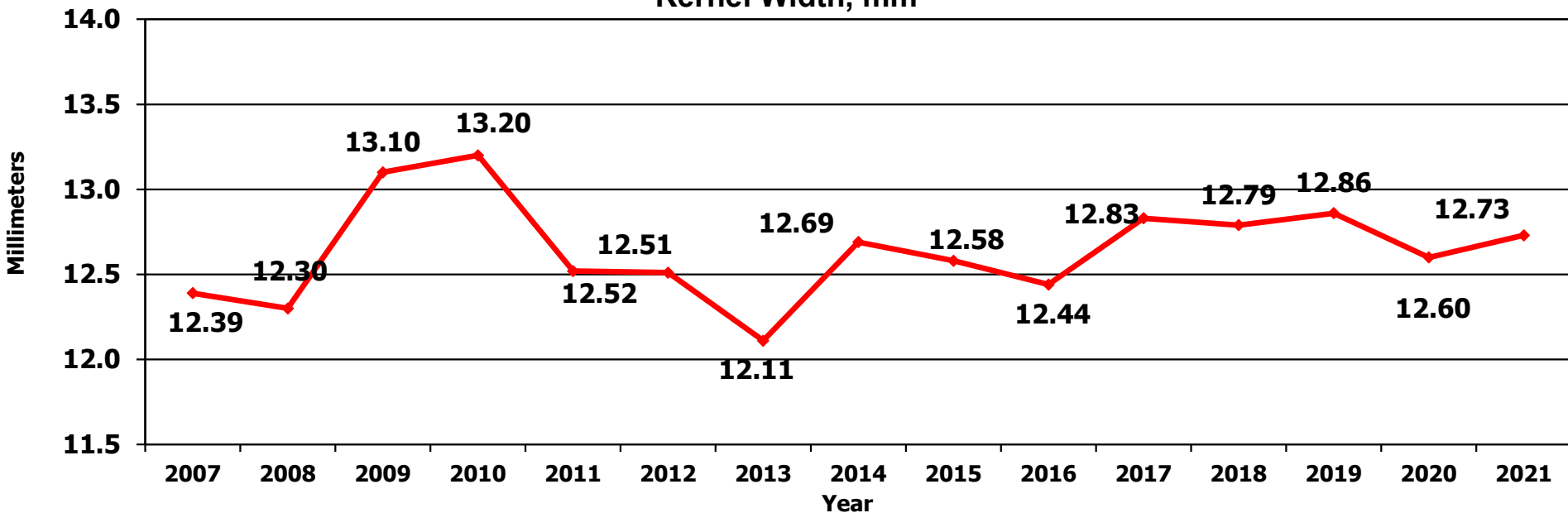**United States Department of Agriculture**
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Almond Set per Tree by Variety, 2019 - 2021

	2019	2019	2021	% Change
Butte	5,261	5,923	4,793	-19.1
Carmel	4,865	5,797	5,469	-5.7
Independence	3,718	3,948	4,389	11.2
Monterey	4,426	4,719	4,324	-8.4
Nonpareil	4,429	5,621	4,512	-19.7
Padre	4,928	8,137	5,214	-35.9

ALMONDS
Kernel Width, mm

Year	Millimeters
2007	12.39
2008	12.30
2009	13.10
2010	13.20
2011	12.52
2012	12.51
2013	12.11
2014	12.69
2015	12.58
2016	12.44
2017	12.83
2018	12.79
2019	12.86
2020	12.60
2021	12.73

ALMONDS
Kernel Thickness, mm

Year	Millimeters
2007	9.96
2008	9.66
2009	9.93
2010	10.30
2011	9.92
2012	9.94
2013	9.76
2014	10.06
2015	9.89
2016	9.93
2017	10.40
2018	10.37
2019	9.93
2020	10.12
2021	9.68
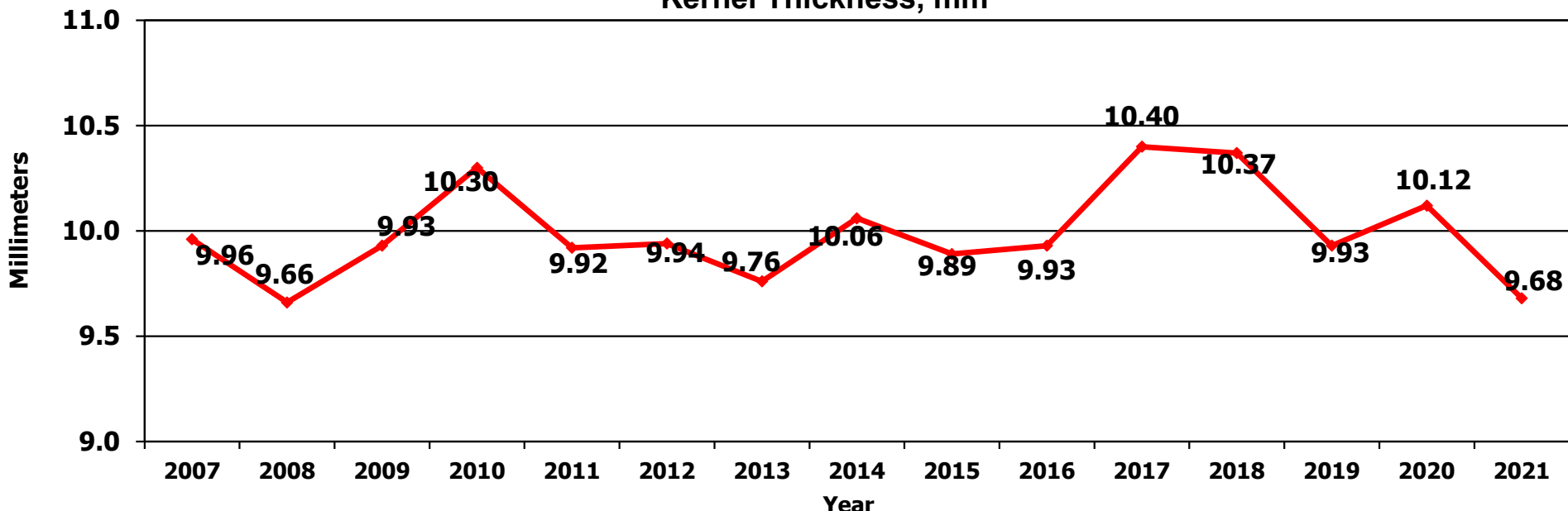
ALMONDS
Kernel Length, mm

Data points by year:
- 2007: 21.81
- 2008: 21.60
- 2009: 22.96
- 2010: 23.38
- 2011: 21.84
- 2012: 21.40
- 2013: 21.35
- 2014: 21.42
- 2015: 21.43
- 2016: 22.09
- 2017: 22.50
- 2018: 21.32
- 2019: 22.89
- 2020: 21.79
- 2021: 22.33
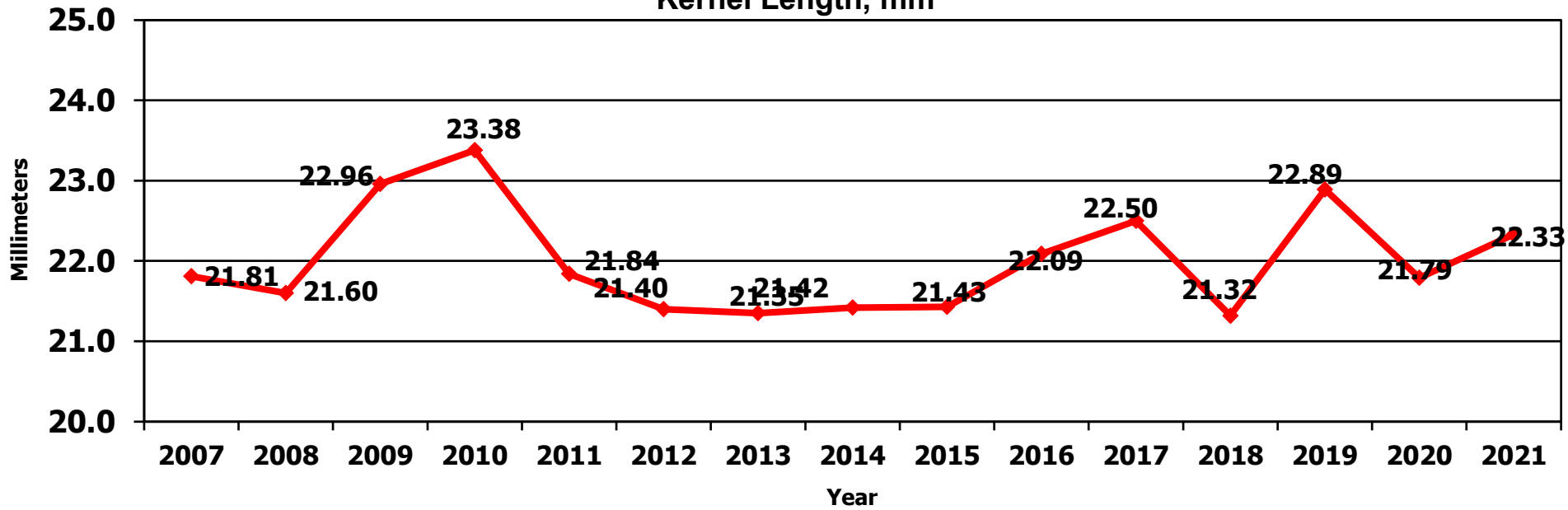
ALMONDS
Percent Sound Nuts

Data points by year:
- 2007: 98.5
- 2008: 99.0
- 2009: 98.9
- 2010: 98.7
- 2011: 98.7
- 2012: 99.1
- 2013: 98.9
- 2014: 98.7
- 2015: 98.8
- 2016: 98.8
- 2017: 98.4
- 2018: 98.9
- 2019: 98.7
- 2020: 98.5
- 2021: 99.3
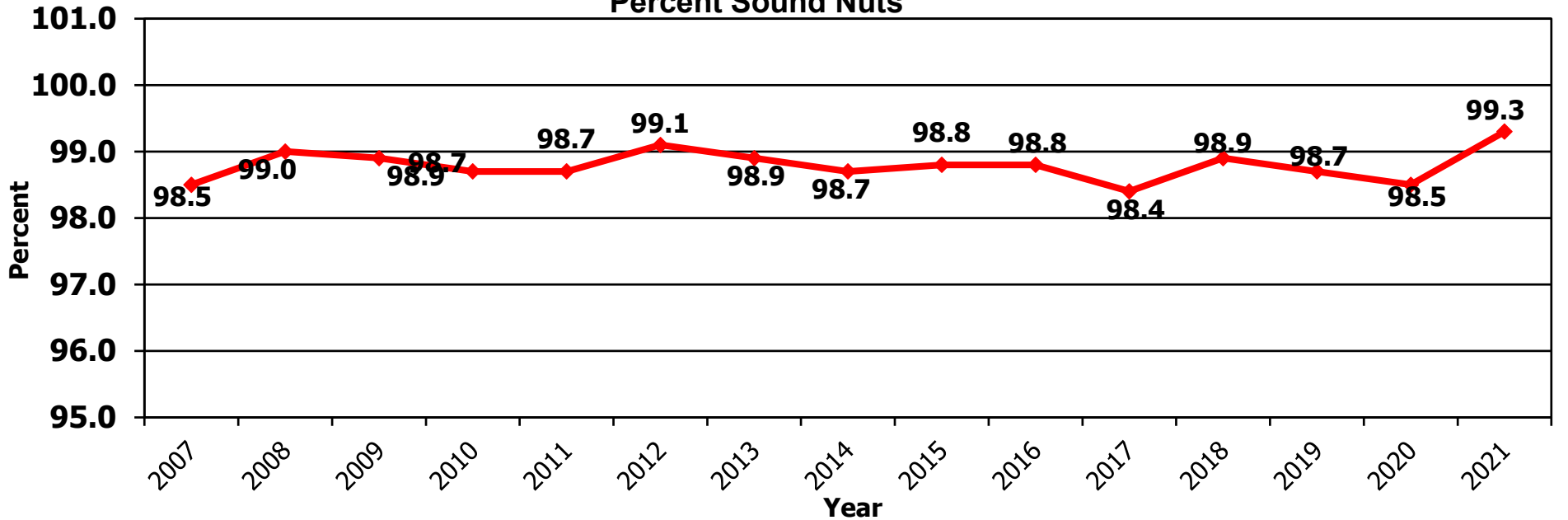
Forecast and all Statistics Available On-line

- PRO Web: www.nass.usda.gov/ca

- NASS Web: www.nass.usda.gov

- PRO Contact: (916) 738-6600

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Thank you to the producers who allowed us to conduct this survey in their orchards.

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