

# History of the Avocado Industry in California



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# Discovery in the New World

- Avocado is native to the New World, originating in Mexico, Central America and the West Indies
- Avocado has long been used by Native Americans in these regions, known by the Aztecs as “ahuacatl”. Spanish later called this “aguacate”.
- First mentioned in print by a historian traveling with Hernando Cortez in 1519

“They are large trees, with broad leaves similar to those of the laurel, but larger and more green. They bear pears weighing a pound and even more, though some weigh less, and the color and shape is that of true pears, and the rind somewhat thicker, but softer, and in the center of the fruit is a seed like a peeled chestnut...and between this and the rind is the part which is eaten, which is abundant and is a paste similar to butter and of very good eating and of good taste, and such that those who have these fruits guard them and exteem them highly and the trees are wild as are the others which I have mentioned, for the chief gardener is God, and Indians apply no work whatever to them. These pears are excellent when eaten with cheese, and they are gathered before they are ripe and stored, and when treated thus they ripen perfectly for eating but after they have reached this stage they spoil quickly if allowed to stand.”

# The First Plantings in California

- The first plantings of avocado in California probably occurred around 1850
- Three seedling avocado trees were brought in from Mexico and planted in Santa Barbara by Judge R. B. Ord in 1871. These trees are generally considered to be the foundation of the avocado industry in California

- The first “commercial” avocado orchard of budded trees was planted in 1908 by William Hertrich for Henry E. Huntington on his estate in San Marino, Los Angeles County. During this time the chef at the Los Angeles Athletic Club saved seeds from avocados imported from Atlixco in the State of Puebla, Mexico.
- The seeds were given to Hertich, grown in pots, and eventually four hundred seedling trees were planted and later budded to varieties then available. The orchard was heavily damaged by the catastrophic “1913 Freeze”, but was rebuilt; a few of the trees still exist

# Is Avocado a Fruit for the Future?

- Avocados were given to Professor E.J. Wickson at U.C. Berkeley who liked the fruit and considered it suitable to grow in home gardens, but...
- He said “there was no prospect for commercial culture because it contained no sugar and fruits were supposed to be sweet—the sweeter the better”

# Despite those remarks

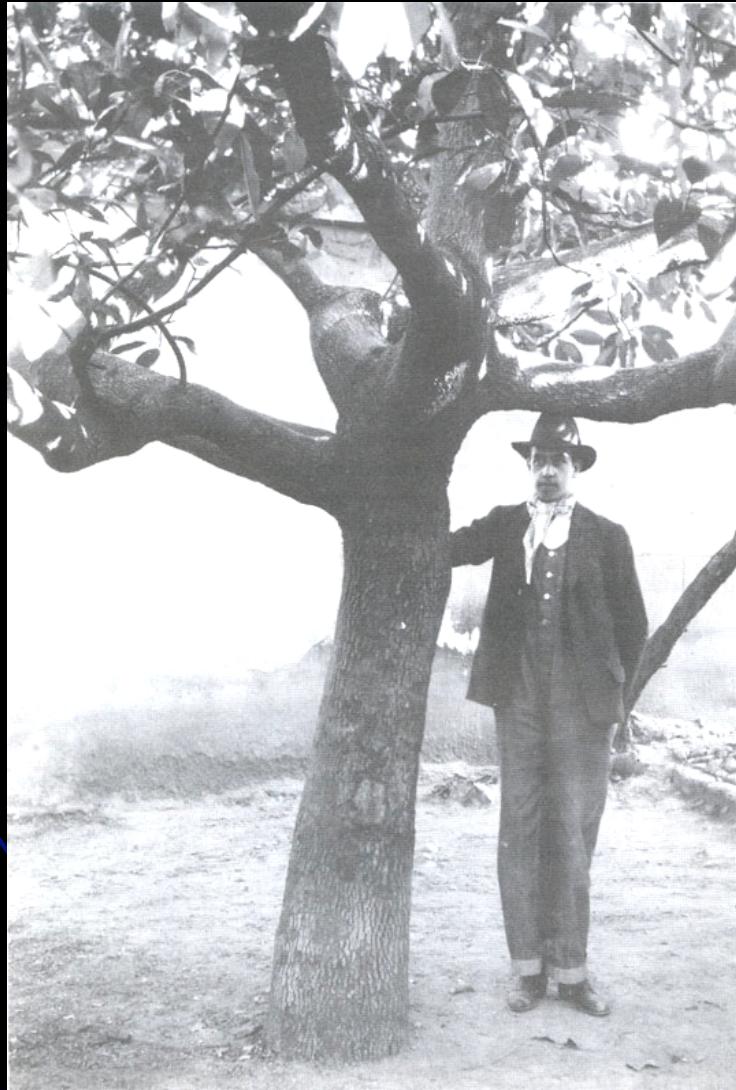
- The possibility of growing avocado on an extensive commercial scale began to be discussed
- Several nurserymen began exploration in some of the best avocado districts in Mexico, a freak accident as a result of the freeze in 1913-1914 led to the “Fuerte” variety

# Development of the 'Fuerte'

- Frederick Popenoe (owner of the West India Gardens nursery in Altadena) sent his son Wilson Popenoe and employee Carl Schmidt to Mexico on collecting expeditions
- They found fruit they liked in the markets of Atlixco and followed them back to the tree and collected budwood



The Parent 'Fuerte' Tree in the Garden of Alejandro  
LeBlanc, Atlixco,  
Mexico, December 1918



# Development of the 'Fuerte'

- One selection (from the backyard of Senor LeBlanc) labeled 'No. 15' was budded onto seedlings at the nursery in Altadena
- A freeze occurred in the winter of 1913 which killed most of the avocado trees in the nursery, except 'No. 15' survived
- Popenoe named these 'Fuerte' (for strong)
- Grower John Whedon reluctantly accepted 50 of these trees, the other varieties that he had ordered did not survive

# The FUERTE AVOCADO

*"The Fuerte is one of the richest and best Avocados I ever ate."* Willett L. Hardin, Ph. D., Consulting Chemist, Mount Washington, Los Angeles,—for two years a resident of Mexico, Student of Avocado Culture, and a Director of the California Avocado Association.

## ITS HISTORY

From Atlixco, in the highlands of Southern Mexico, at an altitude of 6,000 feet, where the climate is dry, the summers hot, and the winters cold, a West India Gardens explorer in 1911 sent in budwood of several varieties, which represented the cream of this region, long famous for its superior Avocados. These varieties were propagated by us in California, and one of them seemed to deserve the name of Fuerte (*vigorous*) by its strong growth and hardiness. We accordingly introduced it under that name and grew it beside many other varieties of both local and foreign origin.

In the succeeding six years the Fuerte has steadily forced its way upwards. Its record has lead J. T. Whedon an orchardist of Yorba Linda, and owner of fifty 4-year old Fuerte trees to declare:

**"I believe there will be more Fuerte trees planted during the next 5 years than all the other varieties put together"**

"The Fuerte is the hardiest variety growing in my orchard. I have 40 varieties growing here, and I am sure that the Fuerte is the strongest grower, the most heat resistant, and the most frost resistant. I have 60 Fuertes just two years of age, and all are now in full bloom. I am resetting a number of trees that have failed for various reasons, and all my resets are Fuertes."—Lester Keller, President First National Bank of Yorba Linda, and Proprietor of Aztec Ranch.

"As the introducer of the Fuerte Avocado, you are surely entitled to the thanks of all people who learn to know that particular variety. Its richness, productiveness, size, season of ripening, vigor of growth, and hardiness, make it an exceptionally desirable variety."—H. A. Stearns, of Stearns & Co., Mfg. Pharmacists, Detroit; California Ranch Owner, and Avocado Grower.

Prices of field grown trees, on hardy Mexican roots; 1 tree, \$4; 5 to 10, \$3.75 each; 10 to 100, \$3.50 each; 100 to 500, \$3.25 each; over 500, \$3 each.

## WEST INDIA GARDENS

F. O. POPENOE, President and Manager  
ALTADENA, CALIFORNIA

# Development of the 'Fuerte'

- These Fuerte trees were planted in Yorba Linda, “establishing the first orchard of a cultivar that would come to be for many years the industry’s principal market preferred variety”.
- This was the variety on which the California industry was built, and was successfully introduced into many other countries.



# Whedon's Fuerte Grove

- His fruit has standing orders from hotels in Los Angeles and San Francisco paying as much as \$12 a dozen
- Because of Fuerte's cold resistance and high quality fruit, the buds from his trees were in great demand and in some years he made up to \$6,000 on buds alone

# Dr. Wilson Popenoe

- U.S.D.A. hired Popenoe to do a complete exploration of Mexico and Central America to look for promising avocado varieties. He did this for nine years and introduced many varieties, but none were as famous as 'Fuerte'
- Dr. Hodgson (UCLA) noted that "due to Popenoe and the USDA, California and Florida growers had the best the world affords in the way of avocado varieties upon which to build a commercial industry"

# Plant Explorer Wilson Popenoe Ready for a Day's Hunt, 1918



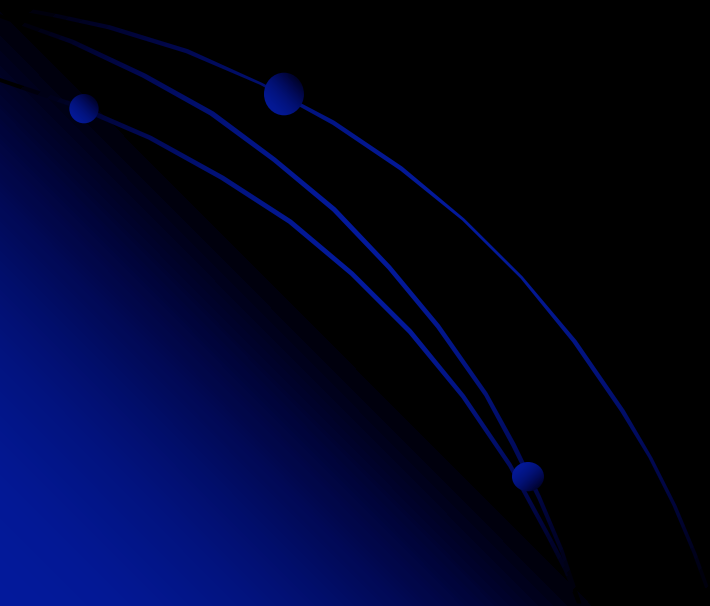
# Formation of an Association

- The confusion of too many varieties spurred the formation of an association in 1915. It was first called the California Ahuacate Association, but soon the word 'avocado' was invented and replace 'ahuacate'
- The purpose of the association was 'improvement in culture, production and marketing'

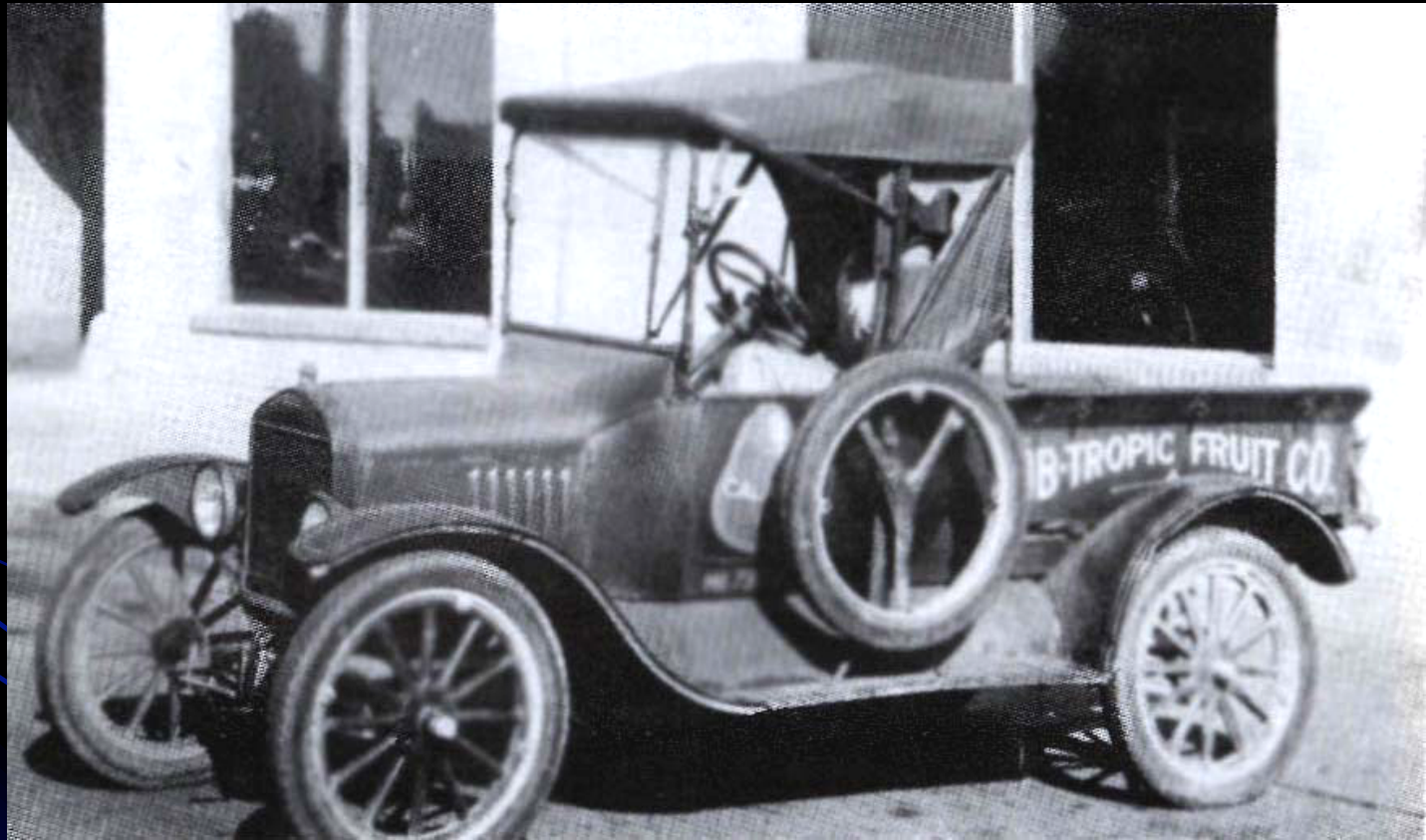


# It was noted at the first meeting

- “Any grower using the detestable term ‘alligator pear’, then in common use in Florida, should be severely reprimanded’



# Store Door Avocado Delivery, About 1915



# The California Avocado Society

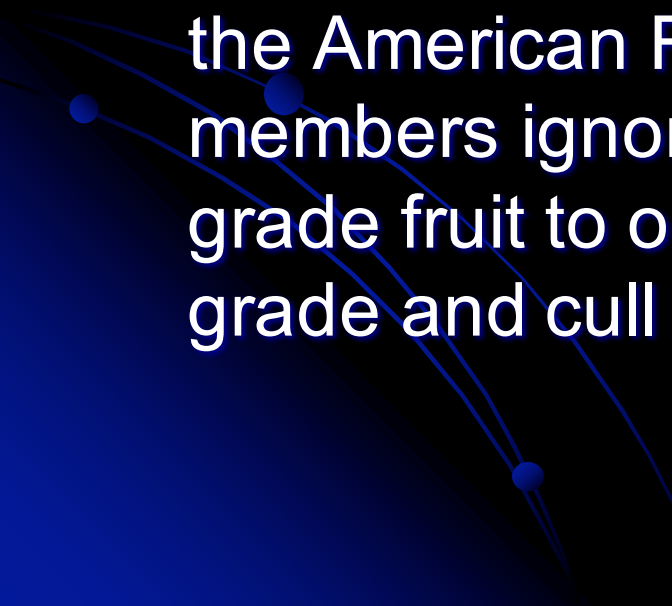
- Association changed its name to Society in 1941, and is still quite functional today
- The Society has been the main driving force for grower education working with the University of California Cooperative Extension, they produce a Yearbook which contains the library of information on avocado



# The Variety Committee

- In 1916 there were 86 varieties, in 1926 there were 400 varieties...lots of confusion in the marketplace!
- The Association's Variety Committee worked on sorting the good ones vs. the bad ones and eventually settled on hybrid varieties between the Mexican (thin skinned) and Guatemalan (thick skinned) races of avocado

# Early Marketing

- Marketing was soon taken out of the Association and left to independent packing houses.
  - Prices varied depending on supply, as high as \$0.50 to \$1.00 per pound, to very low prices
  - Growers tried an early cooperative packing with the American Fruit Growers, but “some members ignored the rules and sold their best grade fruit to old customers and took the low grade and cull fruit to American Fruit Growers”
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# California Avocado Growers Exchange Office and Packing House, Los Angeles, 1925



# The 'Hass' Variety

- Selected at the farm of Rudolph Hass in La Habra, CA in the 1920's
- Hass had planted the 'Lyon' seedlings (a Guatemalan selection) and were field grafted to Fuerte, but Fuerte would not 'take' on one of the seedlings
- He ignored this particular tree, the skin was rough purple-black (all the popular varieties at the time were green-skinned)

# Avocado Groves in La Habra 1928





# The 'Hass' Variety

- The fruit was liked by Hass' son Charles who eventually convinced his dad to try it
- The flesh was creamy, had a nutty taste, lack of fiber, 18% oil content and had a long growing season
- Patented in 1935, when the patent expired in 1952 Hass had made only \$4800 on his new variety

# Rudolph Hass




# The 'Hass' Variety

- Market acceptance of the dark skinned variety was slow because consumers had learned that “green” was the proper color for an avocado
- But steady promotion gradually got it into the marketplace, by 1957 Hass comprised 15% of the crop in California
- By 1972 Hass surpassed Fuerte in volume
- By 1990 Hass 83%, Fuerte 2% in volume

# The 'Hass' Variety

- In 2005 Hass accounted for 92.4% of acreage from California
  - 60,033 out of 64,999 total acres
  - 41% of this acreage was in San Diego County
  - 27% in Ventura County
  - 13% in Riverside County
  - 13% in Santa Barbara County
  - 6% in San Luis Obispo County

- In 2013 Hass accounted for 95.8% of pounds harvested (479,087,288 pounds in U.S.)
  - In 2013 Lamb Hass accounted for 3.6% pounds harvested (17,857,088 pounds in U.S.)
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# Hass Mother Tree



# The 'Hass' Variety

- Hass is the #1 export variety in the subtropical regions of the world, but it does not grow well in more tropical regions such as Southern Florida, Caribbean Islands and Hawaii.
- These tropical areas can grow the West Indian varieties more successfully

# Root Rot becomes Epidemic

- 1930's growers noted tree decline
- Problem was called "apoplexy", "asphyxiation", "decline", "melanorhiza", "waterlogging"
- 1939 South African student proved that the decline was caused by a fungus *Phytophthora cinnamomi*. The fungus caused a root rot of the fine feeder roots.
- Hundreds of acres were being lost



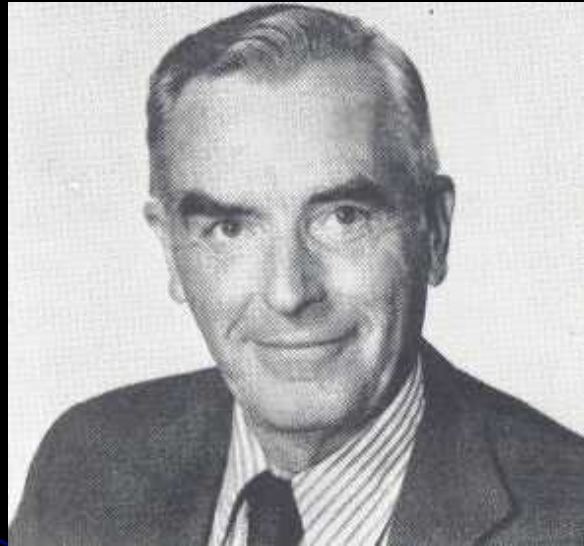
# Avocado Root Rot



# Avocado Research

- University Research began in earnest with studies on avocado root rot by Dr. George Zentmyer in 1948. He worked on factors which affected disease initiation, and potential controls using resistant rootstocks, fungicides, biological and cultural controls, and disease prevention
- Dr. Zentmyer retired in 1981 and died in 2003 after working on many research and writing projects
- Root rot research is still going on and recently the 'Dusa' rootstock has been very successful
- UCR just released in 2014 'Steddom', 'Zentmyer' and 'Uzi', their latest root-rot resistant rootstocks.

# Avocado Researchers George Zentmyer and John Menge



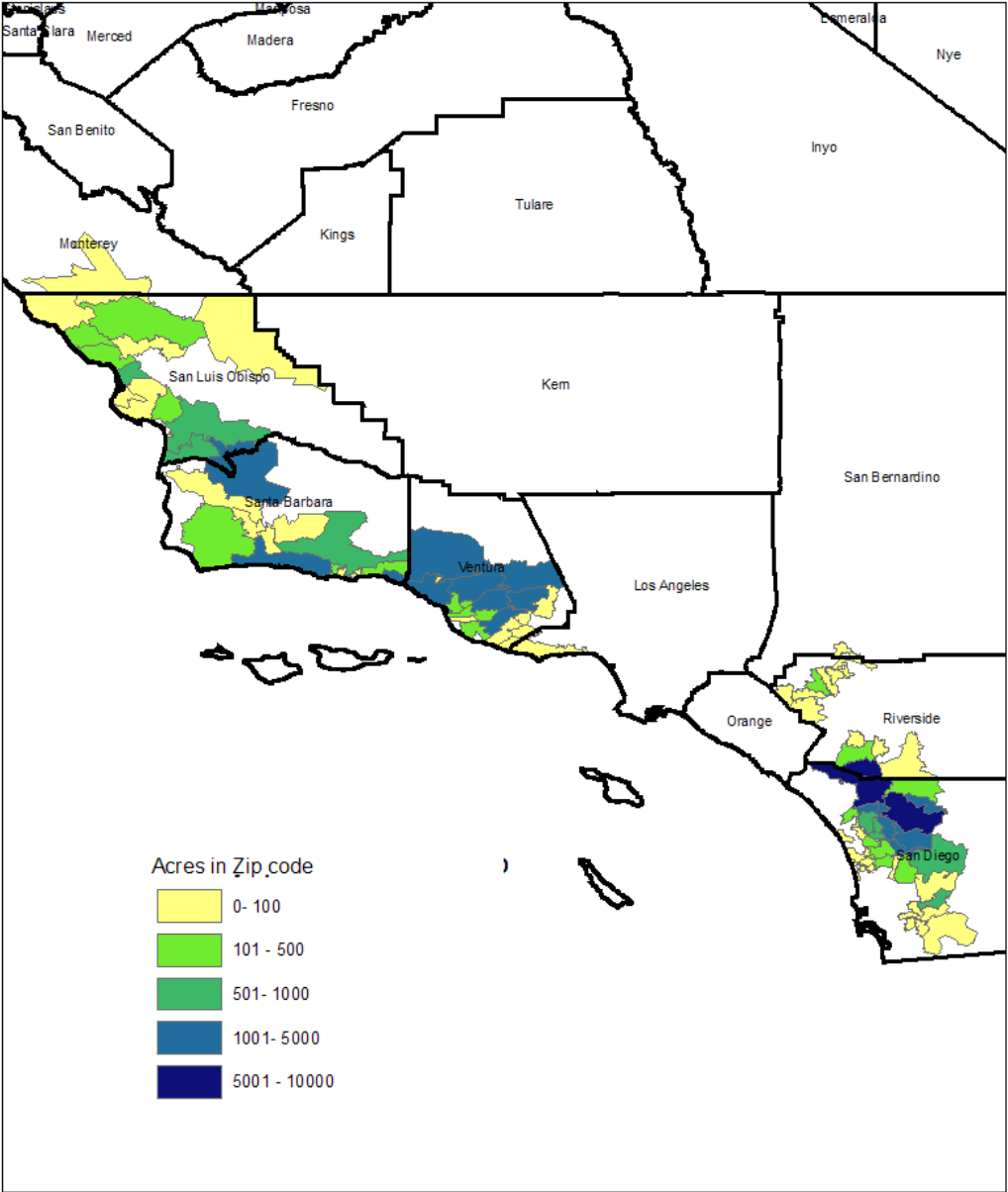
# The Marketing Order

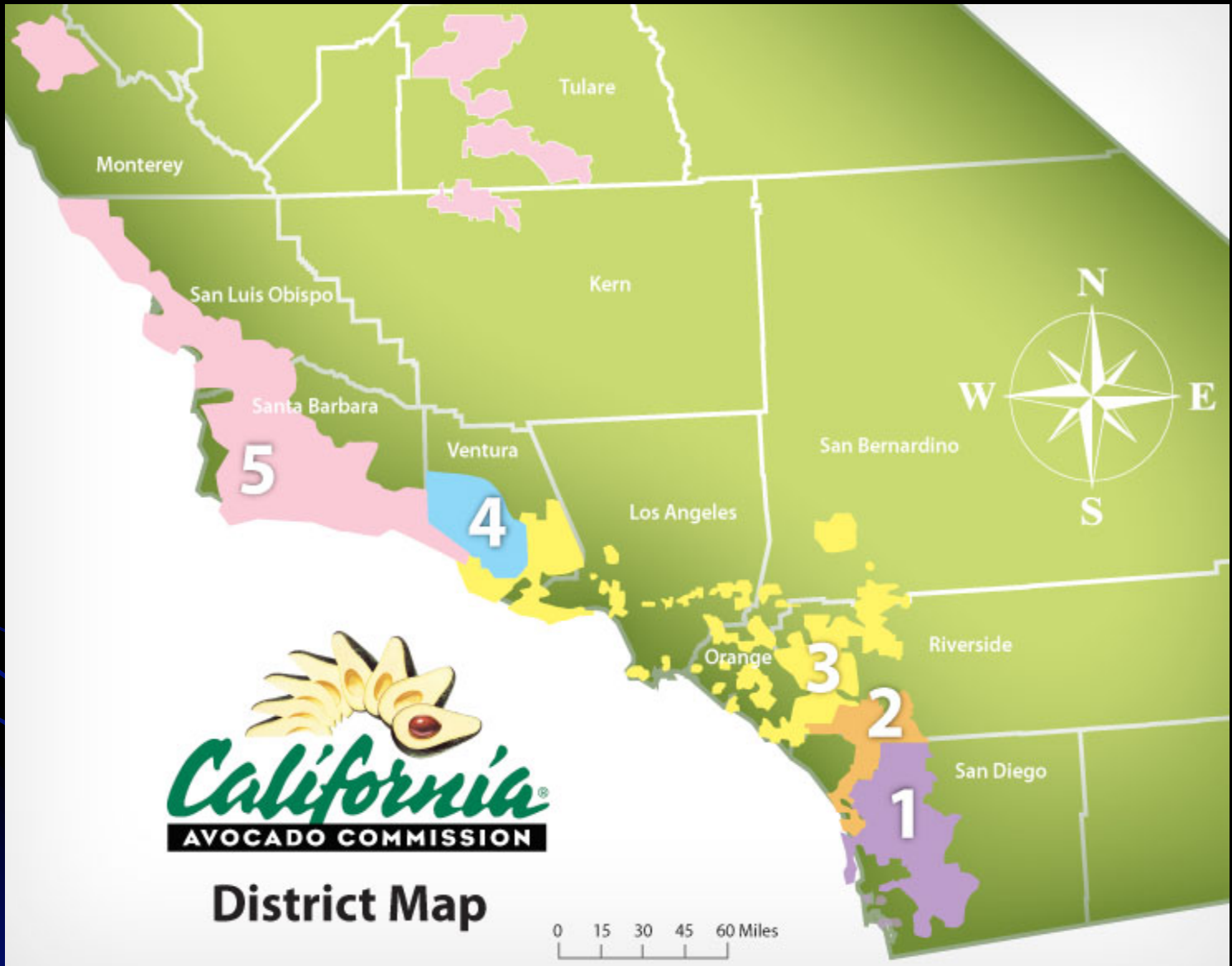
- Almost all market development during the first 40 years was done by growers who organized, first as the Association, then later by the Cooperative (Calavo Growers of California).
- 1961 a State Marketing Order was issued to raise funds for promotion (managed by a board in Sacramento)
- 1977 California Avocado Commission formed by an Assembly bill to manage funds (this bypasses bureaucracy in Sacramento)

# California Avocado Commission

- Board of Directors composed of ten growers from five districts, four handler representatives, one public member
- Responsible for funding promotion (about 95%) and research (about 2.3% to 5%)
- Has been very successful at introducing the avocado into the American diet
- Many other issues (dealing with water, quarantines in Mexico, GAP, emergency programs)

# 2005 Acreage Inventory Distribution by Zip Code



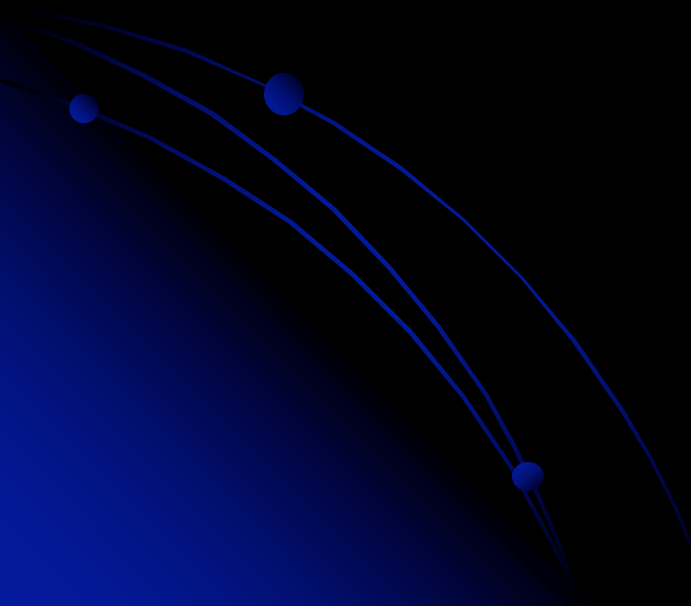


### District Map



# Acres and prices, high and low

Year	Acres	Volume	avg price/lb
● 1986/87	74,812	555.6	\$0.16
● 2016/17	50,856	215.9	\$1.60





# Challenge from Foreign Countries

- California avocado growers have long been concerned about importation of foreign fruit
  1. Concern about bringing in pests that would be difficult or impossible to control
  2. Concern that fruit from countries with lower labor costs and lower water costs would out-compete California fruit



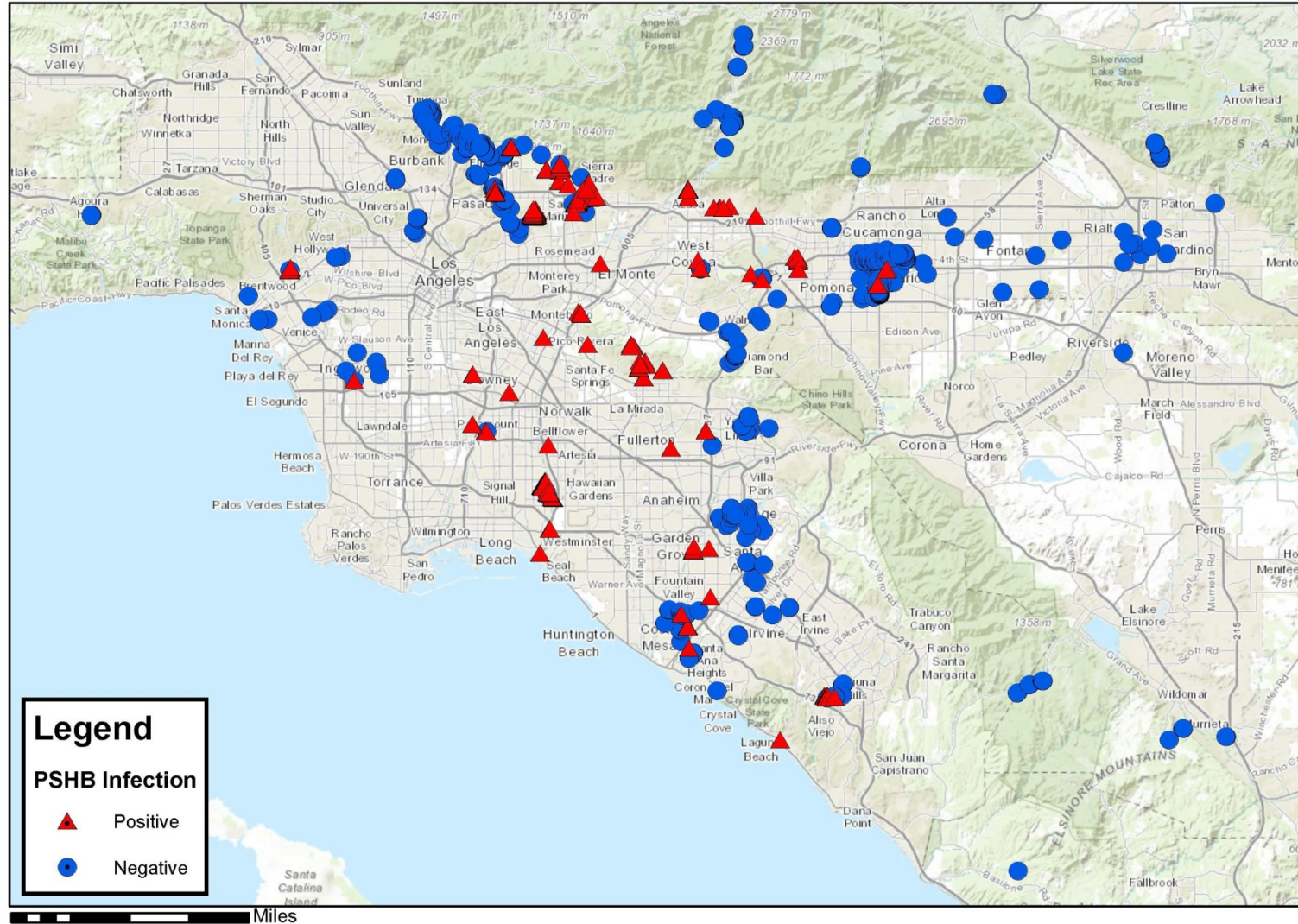
# Polyphagous Shothole Borer

size of a grain of rice



Photo by G. Arakelian

# Polyphagus Shot Hole Borer/*Fusarium* Dieback Distribution Map in Southern California (August 27, 2013)







# The Seed Weevil Quarantine

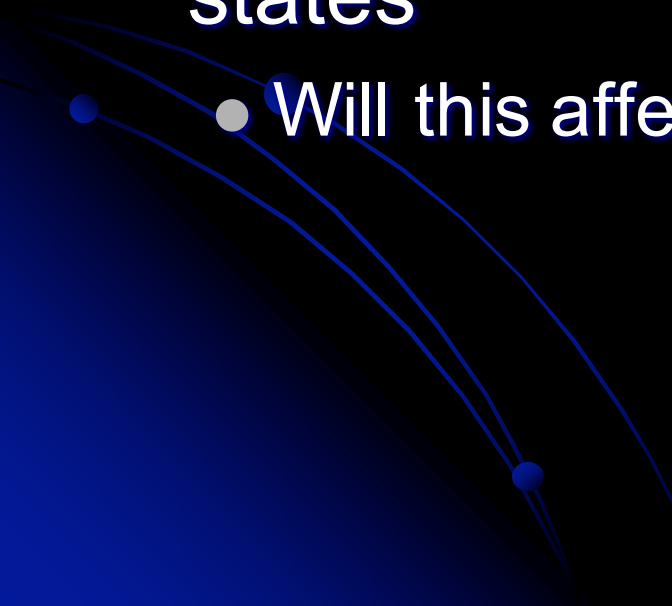
- 1914 Seed Weevil Quarantine to keep out pests from Mexico and Central America
  1. It was successful in keeping out pests
  2. It allowed a new industry to nurture and grow without excessive competition
- Quarantine was amended in 1997 to allow fruit to come in from “pest free zones”, this satisfied the North American Free Trade Agreement passed in 1994

# Avocado Seed Weevil



Fig 1 *Heilipus lauri*. A) Hembra; B) Frutos de *Persea schiedeana* dañados sin alcanzar completo desarrollo; C) Larva; D) Pupa.

# Mexico Enters the U.S.

- In 2001 USDA allowed Mexico to ship into 31 states in the US (eastern and mid-west states)
  - In 2007 Mexico was allowed to ship into all states
  - Will this affect prices for our growers?
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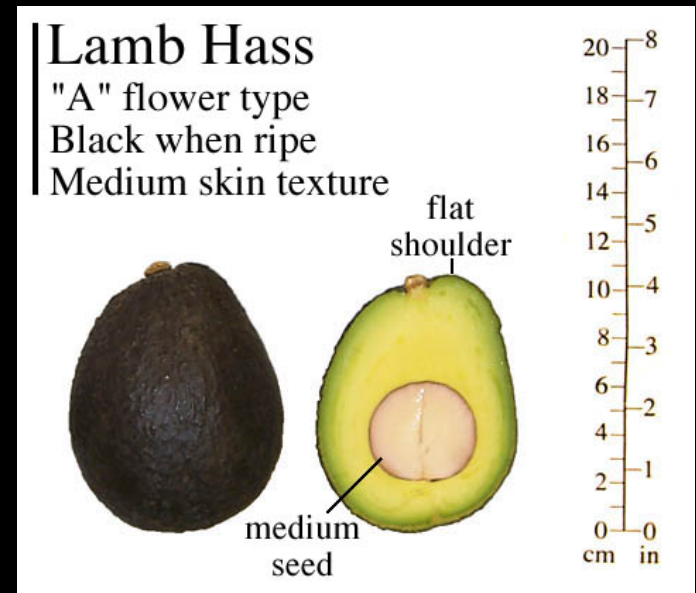


# Chile in the US Market

- Chile has been allowed to ship into all winter markets in the US since 1992
- This Hass fruit comes into the US in our off-season
- It replaced Fuerte, Bacon and Zutano, our winter varieties
- However, this fruit means that Hass fruit are in front of the consumer at the store year-round
- Many people think this has helped our market

# Peru


- And now, Peru is shipping in Hass avocados in the middle of our summer, perhaps displacing our Lamb Hass!



# Federal Marketing Order Hass Avocado Board

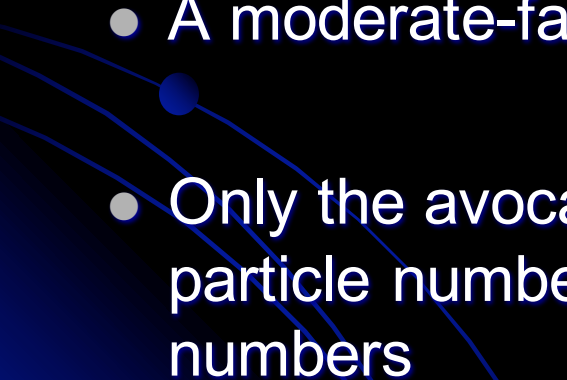
- In 2002 California growers became concerned that CAC was doing all the promotion for Hass, including fruit from foreign countries
- A vote was taken and 86% of growers approved the formation of the Hass Avocado Board
- All countries contribute to a fund to promote only Hass avocados in the U.S.

# Hass Avocado Board

- Goals
    - Enhance marketing effectiveness of stakeholders
    - Establish a compelling nutrition research program (important!!)
    - Provide information and data to stakeholders
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# Nutrition Research

Wang et. al, Penn State University  
Journal of the American Heart Association 2015

- 45 overweight people with high cholesterol
  - 3 cholesterol-lowering diets fed for 5 weeks
    - A lower-fat diet
    - A moderate-fat diet
    - A moderate-fat diet with 1 avocado/day
  - Only the avocado diet significantly decreased LDL particle numbers and small dense LDL cholesterol numbers
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# Other Varieties (perhaps)?

- In a recent interview posted in the Produce News, California Avocado Commission (CAC) President Tom Bellamore discusses the opportunities avocado varieties, other than Hass, may provide California growers.
- Currently, California avocado growers face increasing competition from Peru, Mexico and Chile — all of whom export Hass avocados to the United States in growing numbers.
- While California growers currently provide Hass and alternate avocado varieties, only Hass avocados can be imported from other countries. Therein lies the potential opportunity.

