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California Avocado Industry

Guy Witney

California Avocado Commission

HISTORY

Avocados were introduced to California in the late 1800 s and by the turn of the 20th century several avocado enthusiasts had seedling trees growing in and around the Hollywood area of Los Angeles. In 1911, famous agricultural explorer and botanist F. Wilson Popenoe stated; that the avocado will succeed in Southern California has been proved conclusively by the seedlings planted fifteen to twenty-five years ago which are now bearing, and by more recent experiments with budded trees; and the establishment of an avocado industry in the immediate future is assured.

The industry formed its first organization in Los Angeles on May 14, 1915, the California Avocado Association (which later became known as the California Avocado Society), with 60 charter grower members. Today, the California Avocado Society (CAS) continues to play a valuable role in the industry, including the production of the CAS Yearbooks, considered by many as an important archive of the industry s history. A search through early Yearbooks reveals that many selections of avocado were made in California the early 1900 s and over subsequent years, but few had commercial significance.

In 1924 a group of prominent growers formed the California Avocado Growers Exchange, which was later renamed Calavo Growers of California. Calavo began as a grower cooperative, and in their first year they sold 179,680 pounds of fruit of 46 different avocado varieties. By the 1950 s Fuerte had become the most popular variety accounting for more than two-thirds of the total volume sold. Fuerte s superior flavor, compared to other varieties of the time, caused a decline in the total variety mix, and in the early 1950 s around 25 different named avocados were being commercially grown, packed and shipped in California.

Hass was discovered in La Habra Heights, California, growing as a seedling in an orchard in the early 1930 s. While Hass was first patented by Rudolph Hass in 1935, it was not until large-scale industry expansion occurred in the late 1970 s that Hass replaced Fuerte as the leading California variety.

In the early 1960 s the California Avocado Advisory Board was formed to help coordinate the advertising and promotion for the rapidly growing and optimistic California avocado industry. This became the driving force for the establishment of a state marketing order for generic advertising and promotion of California Avocados, and in 1977, the Advisory Board became what is now know as the California Avocado Commission.

THE INDUSTRY

Today there are more than 6,600 California avocado growers, mostly operating small family owned farms. Their farms are predominantly along the California coast from San Diego to San Luis Obispo, although some small orchards can be found as far north as Monterrey County, and there are a few growers relatively far from the ocean in the southern San Joaquin Valley.

The total commercial growing area has steadily expanded in recent years to more than 65,000 acres with most new acreage north of Los Angeles replacing old citrus orchards or on new previously undeveloped ground.

Hass dominates the modern California industry with nearly 95% of the total 2006 crop (Hass = 526 mm lbs; total = 555 million lbs). Other varieties grown include Bacon, Fuerte, Gwen, Lamb Hass, Pinkerton, Reed and Zutano. Most of these varieties are sold seasonally to specialty markets.

GROWING AND HARVESTING PRACTICES

The climate where California industry is located has a typical Mediterranean climate with winter rainfall averaging from 12 to 30 inches per year and a dry hot summer. These conditions necessitate orchard irrigation, and most orchards are irrigated from spring until the first significant seasonal rain in the late fall or winter. Irrigation systems are almost entirely micro-sprinkler based and because many orchards are on steep hillsides, the systems are pressure compensated to maintain irrigation uniformity across blocks.

Water costs for irrigation in California vary considerably, with some growers near San Diego paying as much as $900 per acre foot for municipal-supplied water, to as low as $80 per acre foot in the north for ground water from wells. (On average, orchards use around 4 acre feet of irrigation water per acre per crop year).

Soils in the growing regions vary tremendously from coarse, shallow decomposed granite to deep, alluvial silts and clay loams. This requires growers in each area to carefully examine their tree fertilizer program to be sure that sufficient nutrients are provided to maximize production. Generally, leaf and soil analyses are used, along with experience from high-producing groves, to determine the fertilizer needs of each grove. Most commonly, nitrogen is limiting, as well as zinc. However, potassium, iron, phosphorous, manganese, and other nutrients may sometimes be deficient. Most orchards use the irrigation system to deliver liquid fertilizers directly to the tree roots during periods of critical nutritional need (late winter/early spring continuing through late summer).

Hass fruit in California reaches maturity in the southern regions first the earliest normally in December and the harvest season from south to north can go from December November in some years; but generally the peak harvest occurs from March August.

California growers follow a guide for the growing and harvesting of avocados called

Growing for Quality (available at www.avocado.org/growers as a print file or as video in English and Spanish).

Growing for Quality is part of a Good Agricultural Practices (GAP) Program and Good Manufacturing Practices Program (GMP) used to ensure fruit quality and food safety.

PESTS AND DISEASES

The two most serious economic pests for avocado industry were both introduced to California relatively recently, each within the last 20 years. After more than four decades of largely pesticide-free insect control, many avocado growers now find it necessary to spray their orchards to minimize foliage and fruit damage.

Persea mite, *Oligonychus perseae*, is native to Mexico and was first discovered attacking avocados in San Diego County in 1990. It appears to be much more damaging to Hass in a dry climate like California than it is in a humid climate, like that found in most of Mexico's production area. If left untreated, persea mite can defoliate trees resulting in tree decline, small fruit, and sunburned fruit. Growers rely on natural biological control unless populations on leaves reach a certain threshold, then oil and sulfur are used to treat for this mite. Residual abamectin from avocado thrips treatments in the spring (see below) sometimes control persea mite later in the season.

The second pest, avocado thrips, *Scirtothrips perseae* was first noticed in California in July 1996, when it was discovered damaging fruit in an avocado orchard near Ventura, California. Research has shown this pest to be native to the sub-tropical highlands of Mexico and Guatemala. In less than a year, avocado thrips spread north and south of Ventura and were found distributed from San Diego to San Luis Obispo. Avocado thrips have resulted in very serious economic losses to the industry, with initial 2006 pest control and crop damage estimates combined at more than $50 million. Biological control of this pest has remained a challenge and research continues. Research on chemical control has identified two pest-specific, soft chemistries, abamectin and imidochloprid, as having activity for avocado thrips control. Both of these materials are registered for use on avocado in California.

Phytophthora cinnamomi, avocado root rot, is the most serious avocado tree disease in California and remains a limiting factor in production. Integrated management of avocado root rot is used to suppress disease pressure, including:

planting clean avocado nursery trees,
selecting well drained soils,
planting on mounds,
preventing the introduction of *P. cinnamomi* into disease-free orchards,
using new root rot resistant rootstocks,
carefully managing soil moisture,
applying phosphorus acid and phosphite salts,
treating with gypsum,
the use of organic mulches.

Under California conditions, avocados will most often grow and produce well despite the presence of *P. cinnamomi* if these management practices are followed.

Other diseases of importance include *Phytophthora citricola*, mainly a problem in cooler wetter areas in the north, and avocado sunblotch viroid (Asbvd). Asbvd can be spread by pollen from infected trees, on contaminated tools, through infecteded budwood, or through sunblotch infected mother seeds during clonal rootstock production in nurseries.

INDUSTRY SUPPORT ORGANIZATIONS

The California avocado industry has a diverse support system made up of several organizations; some are closely connected, while others are loosely associated with one another (Table 1). Each plays a unique role in grower education, regulation, production research, market research, promotional activities, marketing support, public relations, and proactive in industry advocacy activity (both political and strategic). Most of these support organizations evolved over the history of the industry, and are uniquely situated to function in ways that optimize industry support efficiencies.

The commercial Hass avocado industry in California is mature compared to most others worldwide. With an industry dominated by mature orchards and older packing facilities, it has been difficult for some to embrace new production and packing technologies. However, in terms of production research advances, breeding (new varieties and rootstocks), postharvest research, business strategy, and marketing innovation/success California has maintained its position as a world leader.

EXPORT

In the past California has exported fruit to Japan, Korea, Taiwan, China (Hong Kong), Europe, United Kingdom, and Canada. Today most of the California avocado crop is sold in the U.S. market, with only a small export volume due to strong U.S. domestic demand. The USDA has sought access for California avocados to Mexico since 1999, and recent trade negotiations have resulted in the first significant shipments of Hass avocados to Mexico in May 2006. Initial estimates are that the California industry will gain $6 to $24-million per year as a result of this agreement.

Table 1. Key Organizations Serving California Avocado Growers

Organization	Purpose	Funded by	Administered by	Comments
California Avocado Commission **(CAC)**	Build value for California growers through marketing, public relations, production research, and advocacy	Mandatory assessments based on crop value collected from all California growers. Adjusted annually	State of California provides oversight; elected Board of Directors; President/ CEO and staff	Staff administered marketing, public relations, production research, and grower advocacy activities www.avocado.org
Hass Avocado Board **(HAB)**	Generic promotion, marketing and public relations support for all Hass avocados sold within the United States	Mandatory assessments of all Hass sold in the United States based on volume sold	USDA provides oversight; appointed Board of Directors; CAC contracted to administer HAB activities	Established in 2002 after approval by producers and importers of Hass avocados in a national referendum www.avoHQ.com www.avocadocentral.com
California Avocado Society **(CAS)**	Society dedicated to providing education, cultural information, and social/historical support	Dues paid by membership, and industry support through event sponsorship	Board of Directors elected by general membership	Sponsors seminars, annual meeting and produces CAS Yearbook californiaavocadosociety.org
Avocado Inspection Program **(AIP)**	Avocado Certification and Inspection Program ensures avocados shipped in California comply with minimum standards	Mandatory assessments based on fruit volume and paid by California hacker/shippers. Adjusted annually	State of California/ CAC; Committee (AIC) appointed by and advisory to the CA Secretary of Agriculture	Provides inspection of: maturity; defects; fruit size, count and weight; container and pack; and container markings http://www.cdfa.ca.gov/is/fveqc/avocado.htm
Avocado Marketing Research and Information Center **(AMRIC)**	Provides California industry daily inventory and shipment information to guide harvest and marketing strategies	CAC pays for and administers database	CAC databese	Created by CA State Law; also provides the database used to analyze current market situations and forecast trends www.avocado.org/growers/amric.php
University of California Cooperative Extension **(UCCE)**	Applied research and education for growers provided through Specialists and Advisors	U.S.D.A; State of California; individual counties with agriculture	University of California	Source of unbiased information for producers on production and other issues www.ucanr.org/index.cfm
County Agricultural Commissioner (Ag Commissioner)	Regulatory and enforcement function of local county agricultural activities	State of California and local county government	State of California and local county government	Enforcement of pesticides, weights and measures, quarantine measures, etc. http://www.cdfa.ca.gov/exec/cl/countyagmap.htm
AvocadoSource.com	Non-profit foundation; free, searchable virtual library of avocado information and production tools	Hofshi Foundation	Hofshi Foundation	Information repository/ publication collection and tools dedicated to the dissemination of avocado knowledge around the globe www.avocadosource.com