

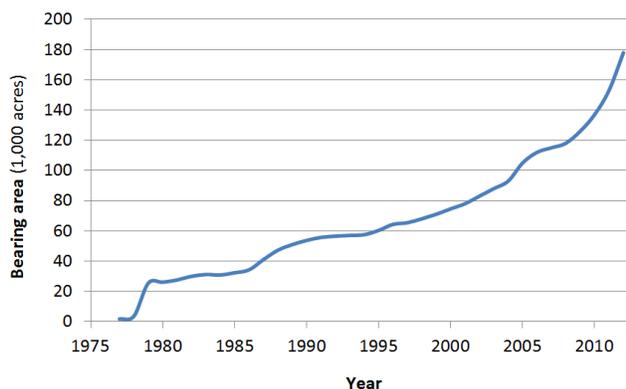
# Pistachio Production in California

*Daniel Geisseler and William R. Horwath*

## Background

The pistachio was introduced to the United States in 1854. In California, the first pistachios were probably planted in Sonoma in 1881<sup>[6]</sup>. However, it took a long time until pistachios became established in California.

In the 1889 edition of the manual “The California Fruits and How to Grow Them”, Edward J. Wickson, who later became the dean of the College of Agriculture and director of the Agricultural Experiment Station at the University of California, wrote that the pistachio nut had been grown experimentally in California for several years and considered it “likely that ere long a commercial product of pistachios may be attained in California”<sup>[9]</sup>. Two decades later, in the 1908 edition of the same manual, Wickson wrote that “The pistachio needs more time to declare its California career”<sup>[10]</sup>. Another decade later, in 1919, he wrote that “commercial results are only just beginning to be attained”<sup>[11]</sup>. Wickson also mentioned that enthusiastic efforts were made to establish pistachios in California and that the USDA had distributed about 25,000 pistachio trees. However, none of the varieties tested at that time was adapted well to the existing conditions<sup>[2]</sup>. Therefore, even though California’s Central Valley with its fertile soil, hot, dry climate and moderately cold winters offered ideal growing conditions for pistachios, the nut remained a marginal crop in California’s agriculture.



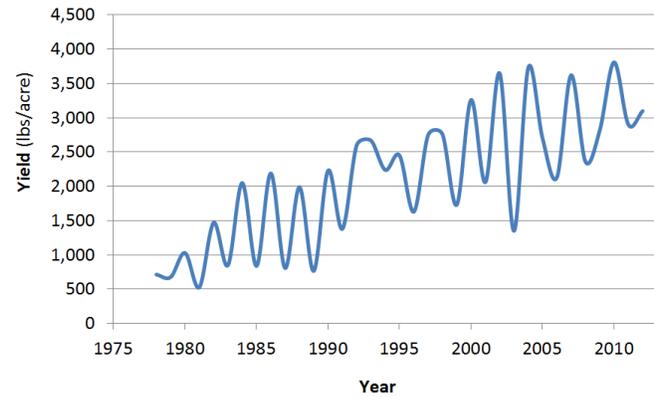
**Figure 1:** Area of bearing pistachio trees in California since 1977<sup>[8]</sup>.

The success story of California pistachios has its roots in a 1929 journey by the American botanist William E. Whitehouse to Persia (modern day Iran), where he collected some 20 pounds of pistachio nuts<sup>[1]</sup>. Upon his return to the U.S., the nuts were planted in test plots. One tree, which Whitehouse named “Kerman”, showed great promise<sup>[1]</sup>. After many years of experimenting, pistachios were finally planted on a larger scale throughout California in the 1960s and later in Arizona and New Mexico. The first commercial crop of 1.5 million pounds “Kerman” pistachios was harvested in California in 1976<sup>[1]</sup>.

Once established, pistachio production increased rapidly from 1,700 acres in 1977, to 178,000 acres in 2012 (Figure 1). The increase in acreage has even accelerated during the past few years<sup>[8]</sup>.

## Yield

The increase in acreage has been mirrored by increases in yield. While the average yield from 1979 to 1982 was 930 lbs/acre, it reached 3160 lbs/acre during the 4-year period from 2009 to 2012 (Figure 2)<sup>[8]</sup>. In pistachio, alternate bearing is common with fruit production fluctuating between ‘on’ years of high yields and ‘off’ years of low yields<sup>[5]</sup>. This is reflected in the large fluctuations of the average yields harvested in California (Figure 2). The long-term trend, however, clearly shows a strong linear increase, which averaged more than 70 lbs/acre per year<sup>[8]</sup>. With the dominant variety still being “Kerman”<sup>[4]</sup>, the yield increase is due to improved management practices and not genetic improvements.



**Figure 2:** Pistachio yield since 1978 in California<sup>[8]</sup>.

## Today’s Production

More than 98% of all pistachios produced in the U.S. are grown in California, with most of the remainder being harvested in New Mexico and Arizona<sup>[7]</sup>. California pistachios are predominantly grown in the southern San Joaquin Valley (Figure 3), with the five leading counties, namely Kern, Madera, Fresno, Kings and Tulare, accounting for 96% of the production. Kern county alone accounted for 42% of the production in 2012<sup>[7]</sup>. In 2012, about 25% of the world’s pistachios were produced in California, making the U.S. the second largest pistachio producer behind Iran, where roughly half of the world’s pistachios were harvested<sup>[3, 7]</sup>.



**Figure 3:** Location of the five leading pistachio producing counties in California<sup>[7]</sup>.

## Fertilization

Based on a survey conducted by the USDA in 1999, California pistachio growers applied on average 117 lbs N/acre. In the same year, the phosphate ( $P_2O_5$ ) and potassium ( $K_2O$ ) applications reached 36 and 17 lbs/acre,

respectively<sup>[7]</sup>. Nitrogen was applied by more than 85% of the growers, while phosphorus and potassium were applied on less than one fourth of the acreage<sup>[7]</sup>.

## References

1. American Pistachio Growers. Available online at: <http://www.americanpistachios.org/power-of-pistachios/history> (Accessed July, 2014).
2. Brown, D.S., Crane, J.C., 1983. Fruit and nut crops – Pistachios. In: A.F. Scheuring (Ed.) A Guidebook to California Agriculture. University of California Press, Berkeley and Los Angeles. pp. 147.
3. FAO. FAOSTAT. Available online at: <http://faostat3.fao.org/faostat-gateway/go/to/home/E> (Accessed July, 2014)
4. Kallsen, C.E., Parfitt, D.E., Maranto, J., Holtz, B.A., 2009. New pistachio varieties show promise for California cultivation. *California Agriculture* 63(1), 18-23.
5. Rosenstock, T.S., Rosa, U.A., Plant, R.E., Brown, P.H., 2010. A reevaluation of alternate bearing in pistachio. *Scientia Horticulturae* 124, 149–152.
6. USDA, 1896. Nut culture in the United States. Government Printing Office, Washington.
7. USDA NASS. Quickstats. Available online at: <http://quickstats.nass.usda.gov/> (Accessed July, 2014)
8. USDA NASS. Historical Data. Available online at: [http://www.nass.usda.gov/Statistics\\_by\\_State/California/Historical\\_Data/#Fruit\\_and\\_Nut\\_Crops](http://www.nass.usda.gov/Statistics_by_State/California/Historical_Data/#Fruit_and_Nut_Crops) (Accessed July, 2014)
9. Wickson, E.J. 1889. The California fruits and how to grow them. 1<sup>st</sup> edition. Dewey & Co. Pacific Rural Press, San Francisco, CA.
10. Wickson, E.J. 1908. The California fruits and how to grow them. 4<sup>th</sup> edition. Pacific Rural Press, San Francisco, CA.
11. Wickson, E.J. 1919. The California fruits and how to grow them. 8<sup>th</sup> edition. Pacific Rural Press, San Francisco, CA.

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