

Walnut Production in California

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Background

The walnut was introduced to California by padres around 1770. According to early sources, the first orchard was planted in San Diego County in 1843^[5]. Initially, walnut trees were mainly planted in Southern California. The early varieties produced small, hard-shelled nuts. In the 1860s, first soft shell varieties, imported from Chile and France were planted in California. With these new varieties, walnut production expanded rapidly, and by 1892, walnut orchards occupied some 15,000 acres. The notion that commercial walnut production was only possible in the southern coastal climate limited the spread of their production^[5]. However, by 1910, walnuts were being displaced by oranges and lemons in Los Angeles and Orange Counties. High production costs, urbanization and pest infestations contributed to the decreasing acreage in Southern California. At the same time, production in central California was expanded. The statewide production area continued to increase and by 1930, walnuts from California covered U.S. consumption^[5]. Between 1920 and 1940, the bearing acreage increased by some 3000 acres annually, reaching approximately 130,000 acres in 1940. After some decrease in the following decades, walnut production was expanded once again in the late 1950s. Walnuts are now harvested on more than 225000 acres and the area is still increasing^[7]. California's walnut industry is based on

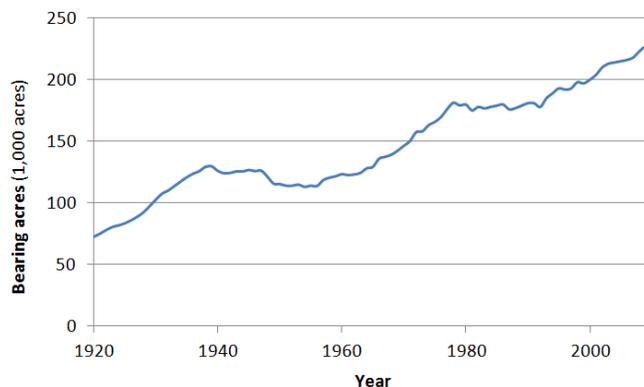


Figure 1: Area of bearing walnut trees in California since 1920^[7].

the species *Juglans regia*, commonly known as Persian or English walnut. black walnut (*Juglans nigra*) is native in the Midwest and east-central U.S. It is grown mainly for its wood, with the majority of plantations being located in Ohio, Kentucky, and Illinois^[4].

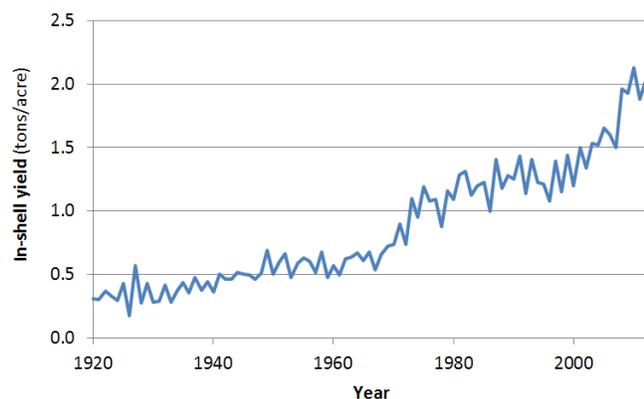


Figure 2: Walnut yield since 1920 in California^[7].

Yield

In-shell walnut yield has increased considerably since 1920 (Figure 3). While the average yield in the 1920s was 0.35 tons, it has now reached 2 tons^[7]. The move to better

growing areas and better management, including irrigation and pest control, contributed to the increase in yields^[2].

Production area

Most walnuts are now produced in the San Joaquin and Sacramento Valleys, with more than half of the acreage being located in San Joaquin, Stanislaus, Tulare, Butte, and Sutter Counties (Figure 2). California growers produce 99 percent of the commercial U.S. supply, with Oregon and Washington accounting for the remaining production^[1, 2]. About a third of the crop is exported^[3]. California walnuts account for three-quarters of world trade^[2]. The most important variety is Chandler, which is planted on about 37% of the bearing acreage. Other important varieties include Hartley (17%) and Howard (9%)^[7]. Chandler is a UC Davis selection which became popular in the 1980. Hartley was selected by William Hunter in the late 19th century and was previously the dominant variety planted in California^[1].



Figure 3: Location of the five leading walnut producing counties in California
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Fertilization

Based on a survey conducted by the USDA in 1999, California walnut growers applied some 109 lbs N/acre. In the same year, the phosphate (P_2O_5) and potassium (K_2O) applications reached 43 and 120 lbs/acre, respectively^[6].

Nitrogen was applied by more than 83% of the growers, while phosphorus and potassium were applied by 13 and 24% of the growers, respectively^[6].

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