WALNUTS

Presented by





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This production summary provides an overview of walnut growing, harvesting, and post harvesting practices. There are some common practices that many large commercial growers use when producing walnuts, and though there are variations in these practices, having an understanding of the most common methods used will be helpful when carrying out regulatory activities.

By the end of this summary, you will be able to:

- 1. List several varieties of commercially produced walnuts.
- 2. List the world's top walnut producing regions.
- 3. Identify the most common farming practices used in the production of walnuts.



Most commercially cultivated types of walnuts found in the U.S. are English walnuts. There are many cultivars or varieties of English walnuts that are commercially grown including Chandler,

Hartley, Howard, Tulare, Serr, and Vina varieties. Each variety has its own unique characteristics and growers select which variety is best for their market. Less commonly cultivated walnut types include the Black Walnut and the California Black Walnut.

China is the largest producer of walnuts in the world, producing nearly half of the global walnut supply. The United States is the second largest producer of walnuts, accounting for approximately one third of the total world production. Domestically, California is the nation's number one walnut producer, accounting for nearly all walnuts produced in the U.S. (Fig 1).



Fig 1 - Top Walnut Producing State in the US

As with other tree nuts, most California walnuts are produced in the San Joaquin and Sacramento Valley regions; however, some are also grown in the coastal valley regions and Sierra foothills. California has approximately 4,900 walnut growers that produce nearly 500,000 tons of walnuts each year!



GROWING

When preparing to plant a new orchard, growers cultivate the soil to loosen clods and grade the orchard. It is common practice to use an attachment to dig deep down and break up any hardpan below

the soil surface to help newly planted trees establish a deep root system. Walnut trees need at least five feet of permeable soil.

Specialized equipment is used to form raised beds or individual mounds on which trees will be planted. Irrigation lines are installed. Walnut trees start as grafted transplants. These grafts are usually an English walnut variety that has been started on a different root stock system such as a California black walnut, which is hardier and more resistant to pest infestations. Root stock systems are usually selected based on the specific local conditions of the orchard.



Once planted, it takes five to seven years for a walnut tree to begin producing nuts that can be harvested. The average life span of a walnut orchard in California is about 35 years. Blossoms emerge in early spring. Walnut trees can be efficiently pollinated by wind, unlike other nut and fruit trees that require honey bee pollination. The nuts will grow and develop for approximately four months through the summer.

Older orchards in California may be irrigated using flood irrigation. Most of the new orchards, however, use drip or sprinkler irrigation systems. These systems allow for greater conservation of water and better control of run-off. The frequency of water application during the growing season depends on the age of the orchard, the levels of precipitation in the region, and other weather conditions.

Growers gauge the need for various fertilizers through soil and leaf analysis throughout the year. The age of the orchard may also help determine what fertilizers are needed for the growing trees. Fertilizers are typically applied to the root zone when the tree is able to use it efficiently. Fertilization of trees may be done in the winter while the trees lay dormant or in the late spring after the foliage of the tree has developed and the fruit is beginning to grow.

Common elements applied to walnut orchards include nitrogen, phosphorus, and potassium in amounts that are determined by element availability in the soil. Growers employ many techniques to protect their orchards from weeds, disease, and pests. Orchards are tended all year round to ensure the health of the trees. Weeds are removed, trees are pruned and sprayed to help manage pests and disease that can damage trees and effect crops. Young trees may also be susceptible to damage by rodents, so growers may install shields or paint to help protect the growing trees.



Walnuts are harvested starting around mid-September. The harvest season usually continues through November. Walnuts are ready to harvest when the green hulls begin to split and nuts naturally drop from

the trees. A mechanical shaker is brought in to vigorously shake each tree, dropping thousands of walnuts to the ground. Walnut harvesting crews then employ a specialized "sweeper" that collects the downed nuts into windrows. A harvester picks the walnuts from the ground and transfers them into a waiting trailer.



From the orchard, the walnuts are delivered to an operation. Here the outer green husk is removed with wet scrubbers. The in-shell nuts are transferred to a dryer for up to 24 hours

where most of the moisture is removed. This drying step helps to prevent deterioration of the nut and protects its quality during storage.



Depending on market demand, walnuts may need to be stored before they are processed and packaged. This can be done once the walnuts are clean and dry. Walnuts can be stacked in large plastic bins or stored in environmentally controlled silos. The product is kept in dark storage and held at 41°E. After drying, walnuts destined for sell as in-shell nuts are then sized according to USDA standards and prepped to be packaged for market. To prepare shelled walnuts, the kernels are mechanically removed from shells. Air is used to separate kernels from the broken shells. Walnut kernels are then screened using electronic color graders and sorters. As a final step before packaging, walnut kernels are hand-sorted according to USDA size, grade, and color standards. This ensures production of a clean, welldried product that meets specific size and color standards.

CONCLUSION

Having a basic understanding of the way walnuts are grown, harvested, sorted, dried, and packed will provide the basic background information that will be helpful to regulators when completing inspections or investigations in the field.

The agricultural practices described in this production summary are common on most large commercial farms like those found in major walnut producing regions in the United States. There are undoubtedly variations in these practices depending on the region, operation size, and individual grower preferences. This is especially true of farms outside of the U.S.

REFERENCES

Boriss, Hayley, Henrich Burnke, and Marcia Kreith. "English Walnuts." English Walnuts. N.p., July 2015. Web. 01 Feb. 2016.

California Walnuts: Sizes & Colors. 1997. N.p.: USDA, n.d. N. pag. Web.

"California Walnuts for More than a Century." California Walnut Company. California Walnut Company, n.d. Web. 01 Feb. 2016.

"CDFA Walnut Fertilization Guidelines." Walnut. CA.gov, n.d. Web. 01 Feb. 2016.

Geisseler, Daniel, and William R. Horwath. "Walnut Production in California." (2014): n. pag. FREP, Mar.-Apr. 2014. Web.

"HOME." - Fruit & Nut Research and Information Center. University of California Division of Agriculture and Natural Resources, n.d. Web. 01 Feb. 2016.

Regia, Juglans. "United States Standards for Grades of Shelled Walnuts." Agricultural Marketing Service. USDA, n.d. Web. 01 Feb. 2016.

Smith, Andrew. "Historical Virtues of the Walnut." Historical Virtues of the Walnut, n.d.: n. pag. Web.

Starrs, Paul F., and Peter Goin. Field Guide to California Agriculture. *Berkeley: U of California*, 2010. 148-54, 208-210, 216-219. Print.

"Walnut (English/Persian: Juglans Regia; Black: Juglans Hindsii)." - The California Backyard Orchard. Division of Agriculture and Natural Resources, University of California, n.d. Web. 01 Feb. 2016.

USDA's National Agricultural Statistics Service. "California Agricultural Statistics, Crop Year 2012." USDA, n.d. 38, 65. Web.

"Walnut." Wikipedia. Wikimedia Foundation, n.d. Web. 01 Feb. 2016.

"Welcome to California Walnuts!" California Walnuts. California Walnuts, n.d. Web. 01 Feb. 2016.

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